

Parental Death and HIV Infection among Adolescents and Young Adults in South Africa

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A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill in
partial fulfillment of the requirements for the degree of Doctor of Philosophy in the
Department of Epidemiology

Chapel Hill
2009

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ABSTRACT

Elizabeth F. Jackson: Parental Death and HIV Infection among
Adolescents and Young Adults in South Africa
(Under the direction of Audrey E. Pettifor)

This dissertation examined the association between parental death and HIV infection among 8,735 young people aged 15-24, utilizing a 2002 household survey from 33 communities. Analyses examined parental loss and HIV in the context of gender, age, and residence with either or both parents, a non-parental adult, or no adult. Survey data indicate that young people of both genders who have experienced parental loss have higher HIV prevalence than their peers, particularly below age 20. For females, loss of a father is associated with the most precise and prolonged elevation in HIV prevalence, while for males, loss of a mother is most detrimental. Taking living situation into account, results indicate that non-residence with a parent or adult is associated with increased prevalence of HIV among young people who have lost one or both parents (YPLP) and young people whose parents are alive (YPPA), although there were important gender differences in how living with no adult affected YPLP. In addition, qualitative data describe the gendered effects of parental loss on HIV risk behavior in two South African communities. Repeated focus group discussions with 54 orphaned or vulnerable young people 14-18 illustrate factors influencing orphan sexual debut and partnership characteristics. The gendered association between HIV and parental loss that is apparent in the survey data may be explained by qualitative findings which indicate that orphan poverty impedes the formation of male orphan sexual partnerships and encourages the formation of female orphan sexual partnerships. Psychosocial aspects of orphanhood may increase HIV risk for both males and females.

ACKNOWLEDGEMENTS

I am indebted to the University of North Carolina at Chapel Hill for travel grant support from the Center for International Studies, off-campus dissertation research funding from the Graduate School, and for Kenan Fellowship funding. In addition, I benefited greatly throughout the writing of this dissertation from the technical assistance and supportive interdisciplinary environment provided by the Carolina Population Center.

I would particularly like to thank Audrey Pettifor who provided me with access to the 2002 survey, encouraged me to gather qualitative data on orphan sexual partnerships, and gave her time so generously. In South Africa, Catherine MacPhail was extremely helpful. Bill Miller provided needed direction during the proposal writing phase, and Frieda Behets and Sharon Weir provided thorough comments which greatly improved the final product.

For the qualitative portion of the dissertation, I am particularly grateful to Suzanne Maman for guidance in design, to the focus group discussion moderators Muriel Kubeka and Mxolisi Dlamini for dedication to the study and helpful insights, and to Pinky Kunene for her work in transcription and translation. To protect confidentiality, the organization who granted access to youth in this study cannot be named, nor can its staff and volunteers. I thank the head of research of this organization and the staff and volunteers of the two after school programs where the qualitative study took place. Their devotion to the youth their work supports, and their passion for HIV prevention among these youth is inspiring.

Finally, I would like to thank my husband, Seth Chadbourne, my mother, Judith Jackson, and my brother, Andrew Jackson, for their support, and my father, Bill Jackson, who first introduced me to South Africa.

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CHAPTER 1

INTRODUCTION

Young people in Southern Africa experience some of the highest rates of HIV incidence in the world; each year, half of all new HIV infections there occur in adolescents and young adults aged 15-24 [2]. Southern Africa remains the sub-region most affected by the HIV pandemic, with one third of the world's population of HIV infected persons [3], and South Africa has high levels of HIV typical of the sub-region. In 2006, 13.7 percent of teenage women and 28 percent of young women aged 20-24 attending antenatal care clinics in South Africa were infected with HIV [4]. HIV prevalence rises from almost zero among adolescents 15 and under to almost 19 percent among 16-18 year olds and over 43 percent among young adults aged 21-25 in one high prevalence community [6].

In addition to extremely high HIV incidence, young people in Southern Africa are burdened by extremely high rates of orphanhood. Over 12 million African children had lost one or both parents to AIDS by 2003 and by 2010, 18 million African children under the age of 18 are expected to be orphaned because of the pandemic [5]. Worldwide, the majority of orphans are adolescents age 12 or older [6] and in South Africa, orphanhood is epidemic among young people. Between 20 and 25 percent of adolescents aged 15-18 [7, 8] and over 27 percent of 15-24 year olds [9] have lost a parent for any reason in South Africa. In 2005, 15.2 percent of 15 to 24 year olds had lost one or both parents because of AIDS [7]. Orphan prevalence is expected to continue to grow well after HIV incidence in South Africa peaks; one model predicts that by 2015 over 35 percent of 17 year olds will be maternally orphaned [10].

Adolescent orphans are especially vulnerable to becoming infected with HIV. A number of recent studies indicate that maternally orphaned female adolescents in Zimbabwe [13-15] and females 15-24 who have lost either parent in South Africa [9] experience higher HIV prevalence than their peers. In addition, orphanhood has been documented as a factor in risky sexual behavior among South African adolescents [11, 16, 17]. Previous South African surveys have found no association between orphanhood and HIV [9, 12, 13].

Documenting increased HIV risk associated with parental loss and understanding pathways through which young people who have lost one or both parents (YPLP) experience heightened risk is crucial for successfully addressing the diverse HIV prevention needs of all young people. This study provided a unique opportunity to examine the relationship between parental loss and HIV among young people aged 15 to 24 in 33 South African communities with high overall HIV prevalence of 20 percent among females and 7.5 percent among males [14]. In addition, a qualitative study of 54 orphan and vulnerable adolescents in KwaZulu-Natal, South Africa, places orphan HIV risk behavior in interpersonal and socio-cultural context.

The overall goal of this dissertation was to evaluate whether HIV prevalence and HIV risk behaviors among young people who have experienced parental loss differ from those of their peers in 33 high HIV prevalence communities. This study explored the HIV prevention needs of YPLP in order to provide needed guidance for developing HIV prevention policies and programs for this large group of young South Africans.

Young people who have lost one or both parents experience bereavement, loss of material and emotional support, and loss of parental presence. However, most young people in South Africa do not live with both parents [11]. Therefore, it is important to evaluate HIV prevalence among YPLP in the context of typical South African living situations, so that YPLP can be compared with young people whose parents are alive

(YPPA), but who do not live with their parents, and the situation of parental loss can be evaluated separately from the situation of non-residence with a parent and non-residence with an adult.

CHAPTER 2

STATEMENT OF SPECIFIC AIMS

Specific Aim 1: To describe the association between HIV prevalence and parental death (maternal, paternal, double, or both alive) among young people aged 15 to 24 by age and gender.

Hypotheses: 1) Females who have lost a parent will have higher HIV prevalence than their peers whose parents are living. 2) Males who have lost a parent will have similar HIV prevalence to their peers whose parents are living. 3) Young people who have lost both parents will have highest HIV prevalence, followed by those who have lost a mother, those who have lost a father and those with living parents.

Specific Aim 2: To describe the association between HIV prevalence and parental death (maternal, paternal, double, or both alive) among young people aged 15 to 24 by age and gender in the context of living situation (residence with one or both parents, a non-parent adult, or no adult).

Hypotheses: 1) Young people of either gender living with no adult will have higher HIV prevalence than their peers. 2) Young people who have lost a parent will have higher HIV prevalence than peers who have not lost a parent and who are in similar living situations.

Specific Aim 3: To qualitatively describe factors that influence orphaned adolescents sexual debut and their types of sexual partnerships.

CHAPTER 3

BACKGROUND

This dissertation begins with a review of the existing literature on the levels and determinants of HIV infection among young people in Sub-Saharan Africa, with special attention to evidence from South Africa. Levels of parental loss and the documented disadvantages of parental loss are presented to demonstrate the compounding of HIV risk that occurs for YPLP. Finally, the Proximate Determinants Model for HIV infection is presented and adapted to illustrate pathways through which YPLP experience heightened HIV prevalence.

HIV INFECTION AMONG YOUNG PEOPLE IN SOUTHERN AFRICA

In 2007, Sub-Saharan Africa was the region with the greatest number of incident infections and deaths worldwide, with 67 percent of the global HIV infected population. In 2007, an estimated 22 million people in the region were living with HIV/AIDS and there were 1.9 million new HIV infections there [12]. Within Sub-Saharan Africa, Southern Africa remains the most HIV affected sub-region in the world, with mean HIV prevalence ranging from approximately 15 to 39 percent among pregnant women in every country except Angola [12]. HIV prevalence has recently declined in Zimbabwe, Botswana, Malawi , and Zambia, but remains high in South Africa, where HIV prevalence among women attending antenatal clinics was 29.1 percent in 2006 [4].

The important role of young people as targets of the HIV epidemic has been affirmed in multiple research studies [13] and in 2007, 45 percent of all new HIV infections occurred

in young people aged 15-24 [12]. Studies in African communities in South Africa have found extremely high HIV prevalence among youth. In the township of Khutsong, prevalence was almost zero among youth under age 16, rising to almost 19 percent among 16-18 year olds and over 43 percent among young adults aged 21-25 [6].

HIV incidence and prevalence are especially high among young females [4, 16, 18, 19]. At the onset of sexual activity, HIV prevalence among young women increases sharply, with much slower increases among young males. Male prevalence eventually approaches that of females though it may or may not reach the same height [14-16]. In African communities with mature HIV epidemics, HIV prevalence is consistently higher among young women than young men [14, 15]. Among both 15-19 and 20-24 year olds, prevalence was between three and ten times greater for women than for men in selected community studies in Zimbabwe, Kenya, Zambia, Botswana and Tanzania [17, 19, 23-25]. This discrepancy has been found in South Africa as well, where adolescent females have HIV prevalence that is three to four times that of their male peers [4, 13, 16, 19-21]. Among youth aged 15-24 in 33 South African communities, the strongest risk factor for being infected with HIV was female gender [14]. The gender difference in HIV prevalence is less perceptible among 15 to 18 year olds, with national HIV prevalence of 4.7 percent among males and 5.3 percent among females as measured by the Nelson Mandela/HSRC 2002 survey [8].

Biological factors may partially explain young women's heightened HIV incidence relative to their male peers. In general, male to female transmission rates are thought to be higher than female to male HIV transmission rates [28, 29], and young women may be at particular risk because of features of their immature genital tracts such as cervical ectopy which has been associated with HIV susceptibility in some studies [22, 23]. In addition, young women may have increased susceptibility to HIV infection at first sex when the hymen is broken [16]. The heightened biological susceptibility of young women to other

sexually transmitted infections (STIs) is also expected to compound their susceptibility to HIV. In the South African community survey dataset which this study uses, current infection with N.gonorrhea or HSV-2 and having a genital ulcer in the past 12 months were independent risk factors for HIV among young people aged 15 to 24 [14].

A number of studies have concluded that patterns of sexual partnership, namely younger women's relationships with older men who are more likely to be infected with HIV, are mainly responsible for the large differences in HIV prevalence between young men and young women [17, 21, 26, 32].

CONTEXTUAL FACTORS IN HIV RISK AMONG YOUNG PEOPLE

Young people in Sub-Saharan Africa express their sexuality in an environment fraught with risk. Relationships are characterized by infidelity, violence, coercion [33], secrecy [34, 35], and age and economic asymmetries [38, 42, 43]. One comprehensive review concluded that transactional sex, broadly defined as engaging in sexual relations in exchange for money or gifts, was the norm in Sub-Saharan Africa and that girls generally expect to receive some sort of payment or gift in exchange for sex [17]. In South Africa, secrecy from adults is thought to place adolescent sexuality "beyond the reach of the best-intentioned and almost always adult-orchestrated HIV prevention efforts" [18]. A host of contextual factors including psychosocial adjustment, education, socioeconomic status, gender roles, a lack of guidance and information about sexuality and reproductive health, low levels of bonding and bridging social capital¹, and early marriage are associated with

¹ According to Campbell et al., "Bonding social capital refers to the existence of trusting and supportive relationships within a local community, which form the context within which people can work collectively to achieve goals of mutual interest (in this case, the reduction of HIV transmission)". Bridging social capital refers to the ability of a community to connect with outside resources, important in HIV prevention because the biomedical, social, and behavioral roots of HIV are "too complex for any one constituency to deal with, particularly

HIV infection and risk behaviors among adolescents and young adults in Sub-Saharan Africa. Early marriage, which exposes young women to older partners and HIV risk in Zimbabwe, Kenya, Zambia, and elsewhere [24, 28, 29], is not an important HIV risk factor in South Africa where early marriage is rare and age at marriage is rising [20-23].

Healthy psychosocial adjustment and functioning are associated with reduced prevalence of HIV infection in some settings. In KwaZulu/Natal, teen women who did not belong to any community group are more likely to be sexually active than their peers; the opposite is true for teen males [24]. Other South African studies indicate a complex association between HIV risk and female social networks; there is indication that expanded social group membership may increase female risk of HIV [25]. Pro-social competence is associated with decreased HIV risk in Zimbabwe. Young women participating in well-functioning community groups were less likely to be infected with HIV than those without well functioning group membership or with no group membership [50]. A causal relationship is difficult to establish, because risk factors for HIV could also be risk factors for decreased participation in community groups [27] or psychosocial problems. Psychosocial problems such as depression and anxiety are associated with HIV risk among adolescents in the United States [26] and in South Africa, depression, alcohol abuse, and post-traumatic stress disorder are each associated with risky sexual experiences such as forced sex and transactional sex [52].

Family characteristics such as closeness, presence of a father, parental control and high self-esteem in the family domain are associated with reduced prevalence of HIV infection in some settings. In the United States, family closeness is associated with later coital debut and fewer sexual partners among females, and males who experience parental behavioral control and family closeness also have fewer sexual partners [27]. Youth from

the poorest and most marginalized communities which are the most vulnerable to the epidemic". 19. Campbell, C., et al., *The impact of social environments on the effectiveness of youth HIV prevention: a South African case study*. AIDS Care, 2005a. **17**(4): p. 471-8.

disconnected or poorly functioning families are at increased risk for adverse health outcomes [28]. In Cape Town, low self-esteem in the family domain was found to be associated with sexual risk behaviors among adolescents of both genders [29]. In addition, non-residence with a parent or parents is associated with risky behaviors among South African young people, such as a greater likelihood of ever having had sex [30] and partner age difference [31]. Many South African youth experience substandard education and high rates of poverty, violence, crime [34-38]. Youth resiliency to these environmental stressors is likely to be compromised by lack of parental guidance [32], particularly from resident fathers [33].

In South Africa, many young people do not live with a father, in large part due to the continuing decline in marriage and cohabitation [48, 64, 65]. The 2003 South African Demographic and Health Survey found that only one third of all young people aged 10-14 live with both parents. Overall, 31 percent live with neither parent, 32.5 percent live with their mother only, and 3 percent live with their father only [11]. In KwaZulu-Natal, a similar living situation was found among 14-24 year olds, with 35.8 percent of all youth living with both parents, 3.8 with only their father, 29.3 with only their mother, and 31.1 percent with neither parent [30] and in Cape Town, the average black 15 year old spends less than half of his or her life with both parents [34].

Father absence is an overriding risk factor for early coital debut and associated risks in females in the United States and New Zealand [35], and childhood residence with father decreases sexual risk-taking for both genders in Cote d'Ivoire [36]. In Kenya, father presence decreases the prevalence of sexual activity and unwanted pregnancies among females age 12-19 in Kenya [53]. In South Africa, males raised without a father are thought to be at increased risk of sexual abuse [37]. For both genders, lower rates of sexual abuse are found with presence of a father in the household, although results are imprecise [38]. Whether father presence is important because it is associated with decreased familial and

ecological stressors or whether father presence stands on its own as a special protective factor is not clear [35].

Educational attainment has recently been associated with reduced prevalence of HIV infection among adolescent and young adult males [39] and females [57, 58] in a variety of Sub-Saharan settings [40, 41]. In KwaZulu-Natal, teenagers of both genders who were not in school were more likely to be sexually active than their in-school peers [24]. Among young women throughout South Africa in 2003, high school completion was associated with decreased HIV prevalence [42]. Education may simply expose young people to information about how to protect themselves from HIV, it may empower young people to more effectively alter their sexual behavior in response to HIV prevention messages [43], or it may simply be the result of other factors which protect youth from HIV infection. In Uganda, education is protective against HIV infection for young women, adjusting for age, marital status, and wealth [44] and health education emphasizing abstinence resulted in a decrease of self-reported sexual activity [45].

Socioeconomic status and employment are associated with adolescent and young adult HIV risk. There is no consensus on the relationship between HIV risk and socioeconomic status in Africa and characteristics of newly infected persons vary by gender and stage of the epidemic. Poverty is often identified as an important determinant of risk for women [46, 47] while higher income has been shown to be a risk factor for men [14, 67] and in some cases both men and women [75]. A recent review of studies from Eastern, Central, and Southern Africa concluded that access to resources is associated with increased HIV risk for women or has no effect in low-income countries. In countries with higher per capita income and greater inequality such as South Africa, where HIV prevalence has been concentrated in communities with the highest levels of poverty [7, 48], higher SES reduces female HIV risk [49]. In rural KwaZulu-Natal, poor women are becoming increasingly vulnerable due to rising levels of unemployment among both genders, particularly among

women [57, 58]. Recent evidence from rural Zimbabwe suggests that decreases in HIV risk are occurring among men and women of higher SES, but not among the poor [40], while other analyses in sub-Saharan Africa suggest that HIV prevalence is higher among the wealthy [50].

Among young people, limited evidence suggests that economic disadvantage heightens female HIV risk and may reduce male risk, although some vulnerable young men in South Africa also receive goods in exchange for sex [51]. In Kenya, lower SES was associated with lower risk of HIV infection among males aged 15 to 24, while lower SES females aged 15 to 24 had almost double the risk of HIV infection than females with high SES [52]. Economic pressure resulting from the relatively low socioeconomic status of young women causes women to need to use their sexuality as an economic resource [17, 32, 36, 82], motivates young females to engage in sex [53, 54], and constrains their power within sexual partnerships throughout Sub-Saharan Africa. Young African women aged 20-22 experience socioeconomic disadvantage relative to all males and non-African females in KwaZulu-Natal – they are less likely to have been employed, more likely to have fruitlessly searched for work, and more likely to have worked for a lower wage when employed [55]. In Kenya, economic asymmetries in partnerships are associated with nonuse of condoms [56], and in South Africa, young women who pay for their own dates have increased power to negotiate for condom use within sexual relationships [53]. However, it is important to note that material exchanges are not driven solely by female poverty, but are embedded in complex cultural practices surrounding sexual relationships, as noted in rural Malawi [57], Botswana [90], and across southern Africa [58].

Women and girls use their sexuality and fertility as resources with value in the context of wider socioeconomic constraints that have rendered young women less powerful than men, and adolescents may not fully realize the risks they are taking [17]. Strengthening young women's socioeconomic position to reduce their exposure to older,

resource-providing male partners has been called for [13]. A recent review calls for exploration of conditional cash transfers to promote safe sexual activity among young women [59]. In addition, involving men as active partners in the protection and support of women and girls is also crucial [58].

Traditional gender roles are an important determinant of adolescent and young adult HIV risk and result in women having little power to control or negotiate within sexual relationships in many Sub-Saharan cultures [60, 61]. A recent review in Sub-Saharan Africa found that adolescent girls had power over establishing and ending sexual relationships but that within partnerships, men had greater bargaining power. Girls have little control over safe sexual practices, condom use, and violence, and even less control over whether male partners have other sex partners [17]. In Zimbabwe, the adoption of behaviors to reduce HIV risk is impeded by low female autonomy and low economic status [62]. Gender inequality has been linked with risky sexual behaviors such as multiple partnerships, violence, coercion, lack of discussion of HIV risk, and low rates of condom use among various populations of South African adolescents [24, 63-65]. Physical violence is frequently used by men within relationships in South Africa [57, 95, 97-99] and has been found to be associated with increased odds of HIV infection among women who experience it [66].

Gender inequality in South Africa has historical roots in traditional patriarchal systems and polygyny. Polygyny typically involves the marriage of multiple younger women to an older male husband and results in large numbers of unmarried young men who want to be sexually active but who are not allowed to impregnate young women. For this reason, polygyny in South Africa is historically associated with practices of premarital sexuality for young males that do not involve penetration and pregnancy [60] such as the Zulu practice of *ukosoma* or “thigh sex” [67]. Christianity and modernity combined to stigmatize polygyny and these traditional sexual practices, but failed to curb the sexual desires of South African youth [68]. For adolescent males in Cape Town, the positive status associated with multiple

partnerships persists [63], although evidence from rural KwaZulu-Natal indicates that the prestige from male multiple concurrent partnerships (partnerships which overlap in time) may be declining due to the HIV epidemic [67].

Zulu culture has been documented by anthropologists as having an especially strong patriline in which women are completely absorbed into their husband's lineages and traditional social control of women's sexuality is unusually strong [60]. Christian missionary influence preserved the patriarchal structures that continue to define South African gender dynamics [18] and strongly held beliefs concerning appropriate sexual behavior for young women continue in present day KwaZulu-Natal [24]. Young women are also disempowered by a lack of information about sexuality; missionary influence discouraged traditional systems of sex education for young women, creating a void of information and guidance for young women in rural KwaZulu-Natal that has not been filled by parents [17, 69].

The limited power of young women within relationships is linked with increased sexual risk behaviors and infection with HIV in South Africa, where the patriarchal code of respect for elders and men limits the scope of girls' responses to sexual advances from men [70]. In rural KwaZulu-Natal, low condom use has been linked with gender inequality. A relationship pattern of male dominance (in relationships where females experienced coercive sex at least once within a three week period), rather than behavior at any specific sexual encounter, was associated with inconsistent condom use [65]. Gender power imbalances decrease the ability of adolescent females to suggest condom use and increase men's inclination to refuse condom use [71] and elements of gender inequality have been linked with women's inability to discuss HIV and condom use in relationships in three South African provinces [64].

Gender differences in partnership behavior are extensive and often involve a lack of serious commitment on the part of males, perhaps because of the traditional permissibility of sexual exploits for younger males whose marriages were historically delayed due to the

polygamous system. In rural KwaZulu-Natal, males tend to initiate relationships [24, 69] and within relationships, most teen women feel that they should accede to their boyfriend's desire for sex [24]. Young people engage in two main types of relationships, serious partnerships and more "modern" relationships without a commitment. Serious partnerships tend to be known by families of both partners. Non-committed relationships are considered a normal right of passage for males, but not for females, who must keep these less serious relationships secret from their parents and community members [24].

INDIVIDUAL BEHAVIORS ASSOCIATED WITH ADOLESCENT AND YOUNG ADULT HIV RISK

Individual behaviors associated with HIV risk among young people include having older sex partners, having sex earlier, having a high number of lifetime sexual partners, concurrency (defined as engaging in multiple overlapping partnerships), having a sexual partner who currently has other sexual partners, and transactional sex. The most accurate behavioral predictor of HIV risk among young people is the number of times a young person has had sexual intercourse with an infected partner without protection. However, information on partner HIV serostatus and the total number of times a person has had sex are rarely known. Partner age can be used as a proxy for partner HIV serostatus and other measures such as time of sexual debut, having a sexual partner who currently has other sexual partners, and exposure to transactional sex can be used to create a rough picture of the amount of exposure an adolescent has had to sex and how risky their exposure may have been.

Partner age difference is likely to explain heightened HIV incidence among female young people. Young women tend to partner with men who are on average 5 to 6 years older than they are and males tend to partner with women who are slightly younger than

they are. The majority of men aged 15-49 in non-marital partnerships partner with women under 20 years of age in Ndola, Zambia and Kisumu, Kenya. At both sites, 27 percent of men aged 24-49 had female partners under 20 years of age [16]. In Kenya, men's nonmarital partners were on average 5.5 years younger and almost half were adolescents [56]. In South Africa, young women 13-24 years old had partners who were 5 yrs older on average in Gauteng [27] and almost 70 percent of women 15-24 in KwaZulu-Natal had a male partner who was 4 or more years older [24]. In Zimbabwe, partner age difference for young women was 5-10 years older on average, while young men had partners of a similar age or slightly younger [13].

Partner age difference is associated with HIV risk among males and females in Zimbabwe, Kenya, Uganda, Zambia, and South Africa [19, 23, 30, 103]. In rural Zimbabwe, substantial age difference between female and male sex partners is thought to be the major behavioral determinant of the more rapid rise in HIV prevalence among young women relative to their male peers [13]. In Uganda, almost 10 percent of HIV in women 15 to 24 was attributable to partnerships with men 10 or more years older [72]. Young women in South Africa aged 15-26 who have a sex partner at least three years older are more likely to be infected with HIV [73]. In general, high risk men in Sub-Saharan Africa such as travelers or sugar daddies are particularly likely to partner with adolescent girls, who make up approximately half of all non-marital partners of these men [17]. This type of dissortative mixing exerts greater influence on STI transmission than concurrent partnerships in mathematical models [74] and data from the United States suggests that partner characteristics such as older age rather than individual risk behaviors are more influential in female HIV risk [75].

In addition, having older male partners is associated with HIV risk behaviors such as reduced negotiating power within relationships for young females in a variety of studies in Sub-Saharan Africa [17, 58], South Africa [74, 75, 85], and in the United States [76]. In

Kenya, age and economic asymmetries were associated with nonuse of condoms in a survey sample of men aged 21 to 45 with a mean age of 26 [56]. Partner age difference of greater than five years was found to be associated with decreased discussion of HIV risk relative to partnerships with less age dissymmetry in three South Africa provinces [64], and in KwaZulu-Natal, greater partner age difference is associated with greater likelihood of men refusing to use condoms among women of all ages [71]. In Botswana, some girls in relationships with significantly older partners experienced coercion, while others reported greater equality in their partnerships [86].

Large partner age difference is interconnected with contextual risk factors for HIV such as economic and educational disadvantage. Young women aged 15-24 in KwaZulu-Natal who weren't attending school were over twice as likely as in-school peers of the same age to have a male sex partner more than 5 years older, indicating that school enrollment may be associated with safer partner selection as well as postponement of sexual debut [24]. In addition, wealthier women had younger partners than their poorer peers and wealthier males had older female partners than poorer males [31]. In Kenya, young women identified money as the factor responsible for older men being able to attract young women as sex partners. Young women often engaged in sexual partnerships with older partners to obtain financial support at the same time that they partnered with males their own age who were in school and unable to provide support [77].

Younger age at first sex is associated with HIV infection among young people in a variety of Sub-Saharan African contexts [17, 38, 42, 107] and in South Africa [22], although not universally [78]. In South Africa, over the past decade, adolescent males report becoming sexually active between the ages of 13 and 16 and females become sexually active between the ages of 15 and 16 [8, 79-81]. In the United States, younger age at first sex is associated with increased risk of STI infection among adolescents and young people up until the age of 24 [82]. For young women 18 to 35 years of age in Zimbabwe, early coital

debut at age 15 or younger is a significant independent predictor of prevalent HIV infection though much of the risk of HIV infection attributable to age at first sex can be explained by the length of time that a woman is sexually active and multiple lifetime partners [83]. Data from studies of adolescents in South Africa, Kenya, and Zambia show that age at first sex of males and females does not explain their differential rates of infection [17, 90]. Younger age at coital debut is also associated with risky adolescent sexual behavior. For young men in KwaZulu-Natal, early coital debut (before age 15) is associated with higher rates of partnership formation in later adolescence [84]. Among young women in Uganda, younger age at first intercourse is linked to having experienced coercive sex [112].

Number of sexual partners is associated with HIV prevalence among adolescents in Uganda [72, 114], adolescent and young adult females in South Africa [73, 85], 14-24 year old males and females in South Africa [26], sexually experienced 17-24 year olds in Zimbabwe [13, 23], and men and women of all ages (including those aged 15 to 24) at study sites in Kenya and Zambia [16]. Number of lifetime partners does not account for higher HIV prevalence in young women relative to their male peers [27, 30]. In Carletonville, South Africa, young women's risk of HIV infection is determined by their risk of infection per partnership rather than the number of partners that they have, relative to young men, because young women's partners tend to be older males who are more likely to be infected with HIV [80].

Having a sexual partner who has other sexual partners is a risk factor for HIV among young women aged 17-24 in Zimbabwe [13]. Mathematical modeling has identified concurrency as important in facilitating the spread of STIs because it decreases the amount of time between sexual contacts [74]. If HIV infection occurs, transmission to a second and concurrent partner is much more efficient due to the high transmission probability associated with recently acquired HIV infections. In Southern Africa, discouraging multiple overlapping sexual partnerships has been identified as an important focus for HIV prevention efforts

[114, 115]. In KwaZulu-Natal, males are more likely to be perceived as having overlapping partnerships than females. Only 2 percent of males reported that their female partners had other partners while almost 40 percent of females reported that their male partners had other partners [24].

Transactional sex, highly prevalent in Sub-Saharan Africa, is associated with HIV infection and HIV risk behaviors such as decreased condom use and sexual negotiation power. A review in Sub-Saharan Africa concluded that the main motivations for girls to engage in sex were financial and included economic survival, increasing longer-term life chances through assistance with school fees or supplies, and increasing status among peers who see sexual activity as normal and a way to obtain nonessential luxuries such as clothing, make-up, and perfume [17]. Transactional sex, defined as engaging in sexual relations in exchange for money or gifts, is prevalent among young women in South Africa in primary as well as non-primary partnerships [83, 84, 116]. Over one fifth of women between the ages of 16 and 20 and almost one third of women aged 21 to 25 reported transactional sex with non-primary partners [86]. In Cape Town, over one fifth of pregnant young adolescents and almost as many non-pregnant matched controls reported having sex for a present or money [87]. An ethnographic study in KwaZulu-Natal concluded “it is virtually taken for granted that sexual relationships will be cemented with gifts from men” [88] and for poor women, monetary exchanges are crucial for maintenance of their households [89].

A variety of studies have found that negotiation for use of condoms is circumscribed in the context of transactional sex among adolescent young women in South Africa [6] and in other Sub-Saharan countries [56]. Transactional sex is associated with past experience of sex partner violence, substance abuse, ever earning money, and living in substandard housing, and may increase women’s HIV risk through its association with gender-based violence, substance use, and socio-economic disadvantage [86]. Among young men, transactional sex is associated with perpetration of intimate partner violence and rape [90].

Adjusting for number of lifetime partners and duration of sexual activity, Soweto women who had participated in transactional sex had 1.5 times the odds of HIV infection of their peers [86]. In KwaZulu-Natal, girls who pay for their own dates gain power in sexual negotiations, and African girls who accept a gift before sex feel they are denying themselves the right to ask their male partner to use a condom [53].

ORPHANHOOD AMONG ADOLESCENTS IN SOUTHERN AFRICA

Extremely high orphan prevalence is characteristic in Sub-Saharan Africa as a consequence of the HIV epidemic. While not all orphaning results from AIDS, orphaning is “the most visible, extensive and measurable impact of AIDS on children” [91]. The time between peak HIV prevalence and peak orphan prevalence has been estimated to be at least 7 to 10 years [121, 122]. By 2010, over 50 million African children under age 18 are expected to be orphaned, and 16 million of these children are predicted to be orphaned because of AIDS [92].

Some sources define orphans as children who have lost both parents before the age of 15 [91], but UNAIDS and UNICEF recommend that orphans be defined as any children under the age of 18 who have lost one or both parents [6]. In order to assess the association between parental loss and HIV risk for all young people, this study focuses on orphans aged 15 to 17 as well as young persons aged 18-24 who have lost a parent. In some South African studies, 18 year olds have been included in the orphan group, as indicated below. Youth who have lost both parents are termed ‘double orphans’; those who have lost a mother are termed ‘maternal orphans’; those who have lost a father are termed ‘paternal orphans’.

In South Africa, orphan prevalence is highest among young people who are African, living in poverty, and living in informal settlements [8] – the populations most severely hit by

the HIV epidemic. Over 14 percent of children 2-18 were identified as orphans in the 2005 South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey, bringing the total number of orphans in South Africa to over 2.5 million [7]. As the HIV epidemic progresses, the proportion of orphans who have lost their mother increases because the majority of maternal deaths are due to AIDS [6, 93]. In general, maternal orphans are likely to be under-represented in cross-sectional household surveys because fostered children may be adopted [94]. In South Africa in 2005 there were an estimated 1.3 million maternal orphans, 1.6 million paternal orphans, and 450,000 double orphans, with 370,000 children orphaned that year [92]. Out of the 2.5 million orphan children in South Africa in 2005, as estimated 1.2 million were orphaned because of AIDS [92]. Prevalence of orphanhood is highest in KwaZulu-Natal, where over one fifth of children had lost a parent in 2002 [8], although high prevalence rates are also found in communities within other provinces such as Free State [95]. In 2005, most orphans were African (92.8 percent) and orphanhood rates differed by setting, with almost 20 percent prevalence of orphanhood in rural informal areas, 11 percent in urban formal areas, and 12 percent in rural formal areas [7].

The percentage of children under 18 who have lost their mothers has doubled in the past 10 years in South Africa [96]. Throughout southern Africa, more children have lost their fathers than their mothers. This is due in part to higher mortality rates among young men in general and to the HIV epidemic. HIV-1, it is theorized, infects men in far greater numbers than women early in an epidemic; as the epidemic matures, more females are infected and maternal mortality increases [97].

The majority of orphans are adolescents and orphan prevalence increases greatly with age. In sub-Saharan Africa in 2005, almost half of all orphans and most double orphans were age 12 and over [92]. A multi-country study using Demographic and Health Survey data found that roughly half of orphans under the age of 15 were aged 10-14 [98]. In

South Africa, between 20 and 25 percent of older adolescents aged 15-18 are orphaned [7, 8]. In 2005, over 15 percent of 15 to 24 year olds had lost a parent because of AIDS [7]. Prevalence of orphanhood among young people aged 15-18 has been found to be particularly high, at 42 percent in a Free State Province community and 46 percent in a township in North West Province during a 2004 orphan census [95]. The Actuarial Society of South Africa's AIDS and Demographic model predicts that by 2015 over 25 percent of all South African 12 year olds and 35 percent of 17 year olds will be maternally orphaned [10]. By 2010, it is predicted that 17 percent (3.2 million) of all South African youth below age 18 will have lost at least one parent [92].

ORPHANS EXPERIENCE MATERIAL, EMOTIONAL AND SOCIAL DISADVANTAGES

Orphan material problems can include lack of access to money, food, clothing, shelter, health care, and education. Emotionally, they may not receive needed care, love, support, and space to grieve for their deceased parents, and socially they may lack supportive peer groups, role models to follow, guidance in difficult situations, and they may experience risks in their immediate environments [91, 99]. The stress and trauma that orphans may experience during parental illness prior to death are also thought to be responsible for poor physical health, psychosocial adaptation and functioning.

Orphans experience socioeconomic disadvantages. Endemic poverty shapes the experiences of most children orphaned because of AIDS in Sub-Saharan Africa [130, 131], influencing their access to health care and education as well as compounding their psychosocial problems such as stress and anxiety. The economic disadvantages faced by orphans begin when a parent is ill. In Welkom, South Africa, households where at least one person was infected with HIV had less than half the average monthly per capita income of other households [100]. Because orphaned children no longer benefit from income earned

by one or both parents, the economic burden of their care falls on another adult or older sibling. In South African households with an HIV infected members, a two year study found that mortality and morbidity were associated with lower household expenditure and mortality was associated with lower household income [101]. Deaths create financial burdens for surviving household members primarily through funeral expenses and loss of future income [102]. In Zimbabwe, orphans live in households that struggle economically [121], and households in which a member has died from AIDS generally suffer more than those in which a death was not due to AIDS [103]. Throughout South Africa, youth who have lost one or both parents are significantly more likely than their non-orphaned peers to live in households without enough money to supply basic food and/or clothing [8]. Many orphan youth live in skip generation households headed by a grandparent over the age of 60, although children living in such households have experienced the least amount of hunger in the past year due to pension support that persons over 60 are eligible to receive. Households with children who report the most frequent experiences of hunger are those headed by young adults or by a single adult – and orphan youth are increasingly likely to live in such households [96].

Orphans experience educational disadvantages. DHS data from 10 countries surveyed in Sub-Saharan Africa between 1992-2000 found orphans less likely to be enrolled in school. In Uganda, the level of orphan biological relatedness to head of household was found to be associated with higher school attendance as well as higher child survival [104]. Outcomes such as low school attendance, which would seem on the surface to be related to resources only, have been shown to affect orphans even when controlling for household economic status. For example, in South Africa, orphan school attendance and achievement was found to suffer relative to non-orphaned children in the same household, even in wealthy households [138, 139]. However, in other South African contexts, no differences have been found in the educational outcomes of orphan and non-orphan youth living in the

same household, indicating that patterns of educational disadvantage may be fairly localized [105].

Orphans in Sub-Saharan Africa experience traumatic life events both before and after a parent's death. Orphans may care for their dying parent or parents and experience major life changes associated with the death of that parent, possible separation from siblings, child labor to provide extra income, and abuse in the context of new living situations [134]. Other stressors include unstable living situations characterized by frequent changes in caretakers [106] and loss of social support of friends and school when moving to a new residence [107]. In rural Zimbabwe, paternal and double orphans are more likely to move in the three years following parental death than are maternal orphans or non-orphan youth [108]. In South Africa in rural KwaZulu-Natal, children aged 0 to 17 whose mothers or fathers died during a two year period were more likely to move out of their household than other children [109]. Older children, boys, and children with stronger familial ties to the household through residence of one or both parents were less likely to move. Child mobility following an AIDS death was lower than mobility following death from other causes, perhaps because AIDS deaths gave parents more time to plan for alternative care than unexpected deaths [109]. In South Africa, among children who have lost their mother only, 28 percent live with their father, and among paternally orphaned children, 65 percent live with their mother [110]. Among double orphans and single orphans who do not live with their surviving parents, over 60 percent live with a grandparent, an estimated 10 percent live with a brother or sister, and about 20 percent live with another relative [110]. In 2005, 2.8 percent of adolescents aged 12 to 18 in South Africa identified themselves as heads of households [7].

Orphans may not be compatible with their caretakers in new living situations. Elderly rural caretakers have problems disciplining orphans from urban areas [147, 148]. Orphans may move when caretakers don't have the economic resources to provide care, or when

orphans are unhappy in their situations [111]. In many cases, extremely high prevalence of HIV results in high orphan prevalence and financial strain that may overwhelm traditional extended-family networks [120, 121]. Lastly, stigma is a significant source of stress in the lives of children orphaned because of AIDS in Sub-Saharan Africa [135, 143], leading to low self-esteem and risk-taking activities such as living on the street, selling sex, and using drugs and alcohol in Zambia [112].

Young people who have experienced parental loss often experience psychosocial dysfunction. The psychosocial functioning of orphans in Sub-Saharan Africa is compromised by their experience of post traumatic stress disorder (PTSD) symptoms, depression, anxiety, and difficulty completing a normal grieving process [141-143, 148, 149, 152-158]. In Uganda, young people age 6 to 20 who have experienced parental loss experience more depression than their peers. Depression scores are lowest among young people living with intact families, followed by those living with widowed mothers, grandparents, and other relatives and highest among young people living with widowed fathers or in child-headed households [113]. In Tanzania, orphans were more likely to have problems with mood, pessimism, a sense of failure, anxiety, and difficulty forming emotional ties than their peers, even when important covariates such as gender, hunger, school attendance, and reward for good behavior were controlled for [114]. In Zimbabwe, youth aged 12-17 who have lost either parent also experience elevated levels of psychological distress [115]. A third study in townships around Cape Town found no evidence for higher levels of emotional and behavioral problems in orphans. It may not have been possible to differentiate between orphans and non-orphans because all children in this setting experienced extremely high levels of emotional and physical stressors. Over 73% of orphans were diagnosed with PTSD [116]. More recently, Cluver and colleagues found increased depression, peer relationship problems, post traumatic stress, and anxiety among

Cape area orphan youth; these associations between orphanhood and mental health problems were accounted for mainly by the problem of stigma [117].

The psychosocial impact of orphanhood is associated with increased risky sexual behavior and behavioral problems among adolescents in the United States. Data show that death of a parent is among the greatest traumas a child can sustain [128, 129] and often leads to secondary traumatic experiences related to subsequent life instability [118, 119]. Traumatic stresses for orphans include exposure to the “fact” of the impending death of their parent and exposure to other family members who are experiencing fear and anxiety about the impending death [120]. Children whose mothers are infected with HIV have psychosocial adjustment difficulties [155] and psychosocial symptoms which remain 6 months after maternal death [121]. Adolescents whose HIV positive parent had severe physical symptoms exhibited more problem behaviors two years later [122]. Unprotected sexual behavior increases steeply among bereaved adolescents immediately after parental death and sexual risk taking remains higher relative to non-bereaved peers over one year later [123]. In Zimbabwe, psychological distress appears to mediate the association between loss of a parent and having ever had sex among 12-17 year olds [159].

Orphan disadvantages are affected by the gender of the parent who is deceased. Loss of a mother has been shown to have a different impact than loss of a father in a variety of Sub-Saharan countries. This is probably because of the different roles each parent may play as wage earner and/or care giver which are both vital to household survival [99]. However, the effects of loss of a parent of either gender are context specific. Evidence that orphan well-being differs by the gender of parent lost is particularly evident in the realm of education. In Zimbabwe, maternal orphans are less likely to complete primary school than non-orphans and paternal and double orphans even after adjusting for socioeconomic status [28, 147, 148]. These patterns are thought to reflect gaps in extended family care for orphans [124] or mother's being more willing to make sacrifices for the education of their

children [125]. Other findings from Zimbabwe suggest that loss of a father, rather than loss of a mother, is associated with being out of school among females [126], although in Tanzania, maternal orphanhood is linked with lower educational attainment in a longitudinal study [127]. In South Africa, loss of a father primarily leads to disadvantages in school attainment, enrollment, and expenditures that are mostly accounted for by household socioeconomic status. Loss of a mother leads to even lower enrollment and attainment in school as well as decreased school expenditures which are *not* accounted for by orphan socioeconomic status. The mechanism for the maternal impact on education is not understood and could be due to trauma caused by maternal death or to the loss of mothers who act as gatekeepers or champions of education [128].

Why study orphans instead of all poor children? Evidence suggests that the construct of orphanhood is a valid indicator of vulnerability for children [91, 125]. However, the question of whether to single orphans out for special intervention has been raised by researchers who believe that poverty is a more critical or appropriate focus [114, 153]. Richter and Desmond propose an economic needs based approach to identifying young people who need assistance in South Africa, pointing out that children in households headed by a single adult or young adults are the most vulnerable to hunger. However, they note that child-only households and skip-generation households are vulnerable in other ways. In addition, Richter and Desmond note that orphan youth are found increasingly in the most vulnerable households headed by young adults or a single adult [96]. Limited research suggests that after controlling for wealth, parental death has little impact on schooling [174, 175] and the gaps between orphan and non-orphan school enrollment are dwarfed by gaps between enrollment of poor and non-poor children [129]. In South Africa, poverty is a greater predictor of sexual risk behaviors than orphan status among adolescents, although orphan status confers added independent risk. Controlling for wealth and other factors, male and female orphans debut earlier sexually and are less likely to

discuss condom use and ways to avoid pregnancy with recent sexual partners that their peers [31].

Although poverty is probably more important than orphan status in predicting educational and health disadvantage, the combination of economic and psychosocial disadvantages conferred by orphan status make this large segment of the population an important focus for further research. A continuum of programmatic responses appropriately targeting particularly vulnerable children as well as others can be utilized to improve the health, education, and welfare of all children at the same time [130]. There are already stigmatizing predictions about the high number of South African orphans who will be poorly socialized and unable to live within society's moral codes, leading to a breakdown of social fabric [131], and orphan-specific programs should be developed with sensitivity to avoid adding to this stigma.

ELEVATED HIV RISK AMONG YOUNG PEOPLE WHO HAVE EXPERIENCED PARENTAL LOSS IN SOUTH AFRICA

High HIV incidence is found among adolescents, with especially high rates among those who have lost one or both parents. The majority of orphans are adolescents, and orphaning rates among adolescents in South Africa are expected to rise dramatically over the next decade. Orphanhood is likely to increase adolescent HIV incidence through a variety of behavioral and contextual pathways in South Africa. Associations are likely to be context-specific, and research to understand the pathways through which orphans become infected with HIV is needed to guide public health policy and develop orphan-specific HIV prevention programs and messages.

Young females who have experienced parental loss have higher STI and HIV prevalence than their peers. The first study documenting increased prevalence of HIV among adolescent orphans was published in late 2005. Among young women 15-18 in rural

Zimbabwe, maternal death was an important predictor of HIV prevalence. All vulnerable young women (orphans, those with HIV-infected or seriously ill parents, and those living in a household that experienced a death in the past year) had higher levels of HIV and STI prevalence, but there was no association between vulnerability and HIV or STI infection for males [38]. In urban Zimbabwe, loss of either parent is associated with increased odds of infection with HIV and/or HSV-2 among adolescent girls aged 15 to 19 [132]. Among 16-19 year old females, loss of a mother is associated with HIV risk and risk behaviors [126]. In South Africa in 2002, HIV prevalence was highest among double orphans, or those who had lost both parents, with lower prevalence among maternal orphans, non-orphans, and paternal orphans. However, statistical tests concluded that there was no difference in prevalence between these groups [8]. A second nationally representative 2003 study documented increased HIV prevalence among young females who had experienced parental loss, but not among males [9] and orphanhood was not associated with HIV status among sexually active rural young people aged 15-26 surveyed in 2002-2003 [73, 133]. These data are summarized in Table 1.

Young people who have experienced parental loss are more likely to have older sex partners and sexual behaviors such as early coital debut that place them at risk for HIV. Young people who have experienced parental death in South Africa and in Zimbabwe are more likely to have had sex than their peers [9, 31, 51, 115, 134]. South African male and female orphans have an earlier age at coital debut [51] and are less likely to discuss condom use and pregnancy avoidance with their recent sex partners [31]. Males who have lost a parent are less likely to have used condoms the last time they had sex [9] and less likely than their peers to have had a first partner younger than they are [51]. Lastly, females who have lost a parent in South Africa are more likely to have had multiple sex partners within the past year than their peers [9]. In KwaZulu-Natal, girls 14-24 who have lost their fathers or who do not live with their fathers have older partners than girls with resident

fathers, while girls with non-resident mothers have younger sex partners than girls with resident mothers [31]. Young people aged 14 to 24 who are not living with one or both parents are more likely to have ever had sex [31] and 14 to 18 year olds who are orphaned have an earlier age of sexual debut and are more likely to have had sex than their non-orphan peers [51]. No study has found a relationship between orphanhood and number of lifetime partners, concurrency (having more than one sexual partnership at the same time) or having a partner who has other partners.

Contextual factors such as poor psychosocial adjustment, low social capital, poor educational outcomes, lack of guidance and information about sexuality, and low socioeconomic status may place young people who have lost one or both parents (YPLP) at increased risk of HIV. YPLP with sub-optimal psychosocial functioning may be less able than their peers to take advantage of social capital available in their communities and participate in community groups. Therefore, these YPLP who are socially isolated could be at increased risk of becoming infected with HIV. In addition, YPLP may be more likely to live in communities with lower social capital [135]. As discussed in B.5, orphans throughout Sub-Saharan Africa experience elevated levels of depression, PTSD, and other internalizing problems. Depression, anxiety, and PTSD have all been found to be associated with increased HIV risk behavior among adolescents in the United States [26], and the psychosocial disadvantages of YPLP of both genders are likely to place them at particularly high risk of HIV infection relative to their peers whose parents are alive (YPPA),

Orphans in South Africa are less likely to be in school than their peers and therefore they are less likely to be exposed to the possibly protective effect of education against HIV. Nationwide in South Africa, mothers and teachers are the most important sources of information about sex and sexual abuse for children aged 12 to 14 [8]. This implies that

orphans who are not in school or who have lost their mothers are unlikely to receive this important guidance and information.

The economic disadvantages experienced by orphans are likely to particularly increase female orphan's risk of HIV infection. As discussed in B.3, adolescent girls throughout Sub-Saharan Africa and in South Africa use their sexuality as a resource with value in the context of wider socioeconomic constraints that have rendered young women less powerful than men [17]. Young women who have lost a parent are likely to have increased economic needs relative to their peers, and may have greater need to use their sexuality as a commodity than other young women. Young people aged 14-24 who have lost a parent are more likely to have ever received anything in exchange for sex [51]. Lower socioeconomic status could explain the earlier sexual debut of adolescent and young adult females who have lost a parent, and could also increase their exposure to transactional sex, higher numbers of lifetime and overlapping partnerships, and older sex partners who can provide them with support. Alternately, lack of a mother could detract from a young woman's ability to attract older partners, and the low socioeconomic status of young women who have experienced parental loss could impede them from attracting older partners. Resources must be available to spend on clothing, hair styles, and other aspects of appearance in order to attract sexual partners in South Africa and throughout the sub-continent [23, 43, 65, 86, 87]. Funds from various relationships can enable girls to improve their appearance and therefore attract additional partners [13], but females who have lost a parent may lack the resources to spend on appearance that are necessary to secure an initial lucrative partnership. Using sexuality as a commodity may be a learned skill; older adolescents are more financially successful in exchanges with male sexual partners than younger girls [17]. Not having a mother available as a role model could lead to reduced success in the use of sexuality as a commodity to be exchanged for resources with older males. In KwaZulu-

Natal, as mentioned above, 14-24 year old young women with non-resident mothers had significantly younger sex partners than those with resident mothers [31].

The lower socioeconomic status created by orphanhood has different implications for males, and may decrease their ability to participate in sexual exchange relationships. Limited evidence suggests that teenage males in KwaZulu-Natal who live with both parents have more sexual partnerships than peers who live with one or neither parent [24]. A climate of changing risk behaviors in rural KwaZulu-Natal is occurring through the breakdown in gender differences in multiple partnerships. At the same time that the prestige of having multiple overlapping sexual partners among males has dwindled in the face of the HIV epidemic [67], women are increasingly open about their own practice of concurrency to satisfy more of their economic needs through support from multiple sexual partnerships [53, 67]. Young males who have lost a parent may be less able to live up to prestigious multiple partnership formation because of their lack of resources, while young females who have lost a parent may continue to rely on multiple partnerships for economic support. Alternately, orphan males may be on the receiving end of material goods in exchange for sex, as is suggested by evidence that orphan males exchange sex for goods such as entertainment [51].

Lastly, the living situations, lack of parental protection, and lower socioeconomic status experienced by orphans are likely to make them more vulnerable to sexual abuse. There has been no documentation of increased sexual abuse of adolescents who are orphaned. However, fewer 14-18 year old South African orphans reported being “willing” to have sex the first time they had intercourse than their non-orphan peers [51].

CONCEPTUAL MODELS FOR HIV RISK AMONG ADOLESCENTS AND YOUNG ADULTS WHO HAVE EXPERIENCED PARENTAL LOSS

The Proximate Determinants model provides a conceptual framework for understanding how parental loss could affect HIV transmission risks for young people. The model illustrates how underlying and proximate determinants affect HIV transmission through exposure of susceptible to HIV infected persons and efficiency of transmission [1] (Figure 1). Sexual behaviors and partnership characteristics (reviewed above) form the most proximal determinants in the model. Partner age difference, having sex earlier, having a high number of lifetime sexual partners, and concurrency contribute to HIV infection through increasing the exposure of susceptible individuals to infected partners. Transactional sex, associated with decreased condom use, increases HIV transmission through efficiency of transmission per contact. Socioeconomic, sociocultural, and demographic contextual factors (reviewed above) affect HIV transmission through more proximal determinants. Psychosocial disfunction could lead young people to seek out a higher number of sex partners or higher risk partnerships, and may also be associated with relationship power dynamics that could result in low condom use. Education, guidance about sexuality and reproductive health, and available social capital could also affect exposure or efficiency of transmission through knowledge and power dynamics. Gender roles are associated with the social acceptance of sexual partnerships between older males and younger females (increasing exposure), concurrent partnerships for males (increasing exposure and efficiency of transmission), and inequalities which affect female ability to discuss HIV risk or initiate condom use in partnerships (increasing efficiency of transmission). Lastly, lower socioeconomic status motivates young women to enter into sexual relationships and further decreases their negotiating power for condom use, affecting exposure and efficiency of transmission.

Young people who have lost a parent (YPLP) acquire sexually transmitted HIV infections through the same proximate and biological determinant pathways as their peers who have not lost a parent, although contextual factors affecting YPLP are likely to increase

their exposure to many risky partnership or behavioral patterns. A modified Proximate Determinants framework with underlying determinants specific to parental loss is presented in Figure 2, based on the categories of orphan disadvantages put forward by Andrews [91] and additional hypotheses discussed above.

In summary, socioeconomic disadvantages experienced by YPLP could provide additional motivation for females to enter into sexual partnerships for economic reasons. Females who have experienced parental loss and who engage in sex for economic reasons could be more likely to have older partners and less likely to use condoms because of transactional dynamics and/or power dynamics in their relationships with older men. It is not known how low socioeconomic status in the context of materiality of sex affects the HIV risk of males who have lost a parent. On the one hand, males who have lost a parent may have even younger female partners than their peers (thereby decreasing their own HIV risk), because younger females may be less demanding in terms of the value of goods exchanged within sexual partnerships. Alternately, if larger partner age differences demand compensation through additional money or gifts, males who have lost a parent could be more likely to have female partners who are closer to their own age (and who are therefore older than the female partners of their peers). These female partners could have lower material expectations of male partners closer to their own age than they would have of older male partners. Lastly, male orphans may simply have fewer partners in general because they can't afford the expected exchanges surrounding sex. For YPLP of both genders, low school enrollment is a risk factor for early coital debut and low condom use. Psychosocial difficulties prevalent among orphans have been associated with risk behaviors in the US, and psychosocial dysfunction could result in YPLP having less power in relationships and being less likely to discuss HIV or condom use. Low social capital, guidance, and information could disempower YPLP and elevate their risk behaviors for HIV exposure and efficiency of transmission. Lastly, the social environments of YPLP are likely to be fraught

with risk; they are likely to live in communities with low social capital, receive decreased protection from adults, and therefore be at increased risk for sexual violence and abuse.

Current sexuality research among South African young people calls for a contextualized understanding of sexual behavior that takes into account cultural and gender-based attitudes and beliefs [6, 27, 41, 47, 65, 180, 181]. Community context is important in HIV prevention because prevalence is highest in communities with a multitude of serious problems such as unemployment, violence, and crime [48]. It is important to acknowledge the societal and historical events that have in part shaped the current cultural context of sexual behavior in South Africa. The legacy of apartheid has contributed to the HIV epidemic on many fronts, including the breakdown of the family through migrant labor, necessary participation in political resistance which interrupted schooling and familial relationships of children, and distrust of the government and its campaigns to promote condom use [182, 183]. The migrant labor system, a cornerstone of apartheid, continues to shape sexual relationships in Hlabisa district in rural KwaZulu/Natal, where most men spend the majority of nights away from their homes [136]. Black youth brutalized by the turmoil of the 1980s bear the brunt of the epidemic today [137, 138]. Youth in the 2002 survey dataset used in this dissertation were both between 1978 and 1987. Lastly, apartheid created extreme inequality and marginalized communities with poor health and educational infrastructures in desperate need of economic development. Societal responses to the HIV epidemic demonstrate that trusting and cohesive communities are more likely to take ownership of the problem of HIV/AIDS [19]. While youth solidarity, empowerment, critical thinking and bonding and bridging social capital enhance HIV prevention, when young people are excluded from access to work and education, political representation, respect, recognition, and participation in informal and formal community networks, effective HIV prevention is undermined [19].

Rather than focusing solely on individual behavior, considering the socio-cultural and relationship-specific context of sexual interactions among adolescent orphans is key to understanding their sexuality and sexual risk [24, 54]. Sexual behavior is the outcome of what happens in a particular partnership rather than an individual behavior [24]. Understanding sexual behavior in the context of specific community settings defined by culture, social capital, SES, and HIV prevalence is key to explaining the difficulty young women face in avoiding HIV infection [50] and to developing successful HIV prevention programs for young people. Understanding the context of young people's lives so that interventions can be designed to draw on their experience enables them to apply newly learned risk averting behaviors in the context of their own sexuality [186, 187]. In addition, documenting and linking individual experiences of HIV risk with causal structural factors can play a supportive role in working towards policy change.

Eaton's framework (Figure 3) provides a conceptual model for understanding the context of the individual sexual behaviors presented in the Proximate Determinants Framework. Because it is not known through which behavioral pathways parental loss may increase HIV incidence, and it is not known whether or how parental loss may interact with gender roles in South Africa to affect HIV risk, it is important to study the association between parental loss and sexual risk behavior in context. Harrison's study of the context of young people's sexual risk in KwaZulu-Natal was based on a framework that merged investigations of individual sexual behavior and its social context [24]. The present study is similar in that it examines sexual behaviors among young people who have and have not experienced parental loss through survey data and through qualitative research methods. This framework was used to guide the qualitative study of contextualized orphan sexual behavior in personal, inter-personal, and cultural/structural domains.

The Eaton model allows for a more nuanced interpretation of the context of HIV risk behavior among YPLP by acknowledging the existence of and interaction between three

different contextual levels of sexual behavior. The Distal context includes cultural and structural factors. The sexual behavior of all young people is influenced by gender dynamics that include cultural acceptance of concurrent partnerships for males and violence against women, the loss of traditional sex education and previous customs governing sexuality before marriage and structural factors such as women's economic inequality. In addition, the distal context for YPLP includes child fostering patterns that determine where orphans live and who their caretakers are. Proximal context in the Eaton model includes interpersonal relationships and the physical and organizational environment. For YPLP in particular, proximal context is shaped by whether they live with their father or mother or another adult caretaker, whether they live in a child-headed household, and characteristics of their household environment such as socioeconomic status and adult supervision. Lack of adult protection makes YPLP more vulnerable to rape or other sexual abuse, the relationships of YPLP with their peers may be compromised by psychosocial difficulties, and YPLP are typically likely to be able to stay in school. YPLP may tend to have less negotiating power within sexual partnerships due to their low socioeconomic status and possibly because of psychosocial difficulties. Lastly, YPLP may be more likely to live in communities with poor social capital.

The personal context of sexual behavior among YPLP includes cognitions and feeling related to sexual behavior and HIV/AIDS, and self-efficacy and self-esteem [139]. It is not known how losing a parent to AIDS may affect sexual behavior, or how living in communities with high levels of HIV/AIDS could impact sexual behavior of YPLP in particular. The psychosocial difficulties that most YPLP face are likely to increase prevalence of risky sexual behavior as discussed above.

In summary, parental loss is an HIV risk factor for South African adolescents and young adults. To better understand HIV risk factors among YPLP and appropriately design and target HIV prevention efforts, this dissertation explores HIV prevalence and proximate

behavioral determinants of HIV risk by type of parental loss and gender as well as living situation. In order to place findings from survey data analysis into context and to understand how parental loss affects interpersonal, environmental, cultural and structural factors in sexual behavior, this study included a qualitative portion with adolescent orphan respondents in one rural and one urban community in KwaZulu-Natal.

CHAPTER 4

METHODS

STUDY DESIGN OVERVIEW FOR SPECIFIC AIMS 1 AND 2

This community-based cross-sectional survey study was designed as the baseline of an evaluation study of the impact of loveLife Youth Centres and loveLife National Adolescent Friendly Clinics. Age, gender, parental loss and HIV status were determined during a survey interview and subsequent laboratory testing for 8,735 young people.

Study Sites. Survey data were collected in 33 communities in the 9 different provinces of South Africa. Study site selection was based on the location of loveLife Youth Centres, termed Y-Centres. Y-Centres are placed in the poorest communities of South Africa to provide youth with sex education, clinical services, skills development, and recreational activity. A total of 11 of the 14 communities where Y-Centers were operating at the time of site selection were chosen for the study. One Y-Center was selected in Free State, Gauteng, Mpumalanga, Northern Cape, Limpopo, North West Province, and Western Cape provinces. In Eastern Cape and Kwazulu-Natal provinces, two youth centers were selected to better capture predicted differential HIV prevalence rates in the north and south of these two provinces.

In each of the 11 health districts where Y-Centre communities were chosen as study sites, a community with a loveLife National Adolescent Friendly Clinic and a control community were chosen for comparison. Control communities had clinics that were not part of the loveLife National Adolescent Friendly Clinic Initiative. Sites were matched by health district to ensure that baseline HIV prevalence would be as similar as possible between Y-

Centre, NAFCI, and control communities. Communities selected for the study were far apart to reduce the potential for contamination of control sites through exposure to loveLife Y-Centres or clinics. Each Y-Centre, loveLife clinic, or control clinic served as the epicenter of the survey enumeration area in each community. Young people living within a 2 km radius of the service delivery epicenter were eligible to participate in the survey.

Study Population: Selection Criteria and Sampling. At each service delivery point (Y-Centre, loveLife clinic, or comparison clinic), a GPS reading was taken. Every 1996 census enumeration area (EA) falling within a 2 km radius of the service delivery point was recorded and translated into the equivalent 2001 census EA through Statistics South Africa, to get a list of all 2001 EAs within 2 kilometers of the service delivery epicenter. Where available, 20 EAs were sampled in each community; if there were fewer than 20 EAs within 2 kilometers of the epicenter, then all EAs within 2 kms were selected. Segments consisting of the target number of households needed (54) to achieve the necessary number of interviews (15) were drawn within each selected enumeration area, based on natural boundaries. Within each enumeration area, one segment was randomly selected. Each household in the selected segment was visited and a list of all household members and their ages was created. Using this list, one young person aged 15-24 was randomly selected by the field team manager as a potential survey respondent. If the selected respondent was not present when the interviewer returned to the household, at least three attempts to reach him or her were made on different days and at different times of day.

Study Population: Recruitment. Young people 15-24 who were sampled were asked to respond to an interviewer administered survey and to provide biological specimens to test for HIV, C.trachomatis and N.gonorrhea. Informed consent was obtained from all young people. For youths aged 15-17, additional parental consent was secured. The final sample included survey data and HIV and STI test results from 8,735 respondents.

Data Collection: Questionnaire. The questionnaire was an extensive battery of over 250 questions. Questions in the instrument were included based on a review of similar international and South African surveys of youth sexual behavior and attitudes and measurements of loveLife exposure [20]. The questionnaire asked youth about their general attitudes, community participation and recreational activities, exposure to the mass media, communication with family and peers, first sexual relationship characteristics, relationships with most recent primary and casual sexual partners, sexual behavior, knowledge of and attitudes toward HIV risk and AIDS, health seeking behavior, alcohol and drug use, experience with STIs and pregnancy, contraceptive use, exposure to loveLife intervention programs, and demographic such as household composition and orphan status.

Data Collection: Laboratory Data. HIV status was assessed from oral fluid samples collected with the Orasure HIV-1 Specimen Collection Device from Orasure Technologies Incorporated in Bethlehem, PA. Within 21 days of collection, oral samples were tested for HIV-1/2 antibodies using the Vironostika Uni-Form II HIV-1/2 plus O MicroElisa System from Biomerieux in Durham, NC. Urine samples were collected and tested for C.trachomatis and N.gonorrhea using the automated COBAS AMPLICOR PCR assay according to manufacturer instructions from Roche Diagnostics.

Data Management. Data were double entered and then verified. The dataset used for secondary analysis was given to Elizabeth Jackson after the UNC School of Public Health IRB issued an IRB exemption (IRB Number 05-2864) on January 27, 2006. The cleaned dataset of over 48 megabytes consisting of 8,735 observations in STATA format was presented on a data CD. The CD is kept in a locked home office and a copy of this dataset used for analysis is kept on a password protected computer on the secure network of the Carolina Population Center at UNC. The software program STATA 9.2 was used for data analysis.

SPECIFIC AIM 1: DESCRIBE HIV PREVALENCE BY EXPERIENCE OF PARENTAL LOSS AND GENDER

Measurements: Outcome. The outcome for this specific aim was HIV status. Infected individuals were identified as those who test positive for antibodies to HIV-1/2; individuals who were antibody negative were assessed as uninfected. Associations between parental loss and HIV status were assessed using logistic regression.

Measurements: Factor of Interest. Parental loss and gender were the exposures of interest in this analysis. Young people who had lost a mother, a father, or both parents were compared with young people who had lost neither parent (Table 2). In addition, those who had lost one or both parents were compared as a group with those who had not lost a parent. In the survey, each respondent was asked if his or her mother and father were alive. Possible responses to this question were “Yes”, “No”, or “Don’t Know”. When a young person does not know whether a parent is dead or alive, it is unlikely that this parent is able to play a role in the child’s life as either wage earner or care giver, two important parental roles identified in a study of orphanhood in Southern Africa [99]. In these cases, parents whose status is not known were considered to be absent from a child’s life and counted as dead in analysis. While this may lead to overestimation of parental death, the implications for children’s care remain the same [96]. A total of 125 fathers and 17 mothers were counted as dead in analysis, for this reason. Young people were more likely to know whether or not their mother was alive than whether or not their father was alive, probably because in South Africa, youth are more likely to be cared for by their mothers than by their fathers. Among all respondents, 1.43 percent did not know whether their father was alive and 0.19 percent did not know whether their mother was alive. The 125 youth who didn’t know if their father was alive represented 5.8 percent of the 2,150 youth who were counted as having dead fathers in our analysis. The 17 youth who didn’t know if their mother was

alive represented 2.4 percent of the 706 youth who were counted as having dead mothers in our analysis.

Measurements: Confounding Variables. Age was the only confounding variable considered in this analysis because other variables which could help to explain the relationship between parental loss and HIV infection (variables such as school enrollment, proxy measures for socioeconomic status, partner age difference, age at coital debut and condom use) are likely to be on the causal pathway between parental loss and HIV infection. The goal of this analysis was to assess HIV prevalence by parental loss and gender status in the study population, so these factors were not included as confounders in the model. It was important to include age in the model because the prevalence of both parental loss and HIV increase with age in this population. Age was measured in years and ranged from 15 to 24. A graphical illustration of the multivariable model is provided below in Figure 4.

To evaluate the assumption that young people infected with HIV acquired their infections through sexual exposure, rather than perinatal transmission, an additional analysis was performed to test the association between HIV and parental loss, which included only those young people who reported ever having anal or vaginal intercourse. Caution was taken in interpreting these results because young people whose sexual experience was restricted to rape or sexual abuse might have been less likely to report having experienced sexual activity than youth whose sexual experience was not through rape or abuse.

Data Analysis: Univariable. The prevalence of HIV infection by gender and parental loss was presented in graph format using the four parental loss categories described above and age as a categorical variable. Prevalence of parental loss by gender and age was also presented in graph format. The frequency of missing data for all variables of interest was examined. Variables for which more than 2 percent of data was missing were to be

assessed to determine whether data was missing at random. However, there were no variables for which more than 2 percent of data was missing.

Data Analysis: Multivariable. Odds ratios measuring the strength of association between HIV infection and parental loss were estimated by maximum likelihood with adjustment for age and gender using logistic regression. Odds ratios were the preferred measurement for these associations because the cross-sectional dataset did not allow measurement of HIV incidence rates. Clustering at the community level was taken into account in each model. Exposure to loveLife Y-Centres or clinics was assessed as a potential confounder, but inclusion of this exposure in the model did not alter the measured association between HIV and parental loss. The relationship between age and HIV status was graphically assessed and found to be somewhat linear for females and non-linear for males. Age was modeled with a restricted quadratic spline equation [140] which supplied a superior model fit as tested with the Wald chi-square test.

A full model including terms for interaction between age and parental loss was constructed for each gender. Sets of interaction terms were tested using the Wald chi-square test to determine whether they increased the fit of the model. Interaction terms that did not improve the fit of the model were removed using a backward elimination model-building strategy.

SPECIFIC AIM 2: DESCRIBE HIV PREVALENCE BY EXPERIENCE OF PARENTAL LOSS AND LIVING SITUATION

Measurements: Outcome. The outcome for this specific aim was HIV status, as described above.

Measurements: Factor of Interest. The outcome of HIV infection was assessed by exposure to parental loss and living situation. Young people were characterized as having lost either a mother or a father (maternal and paternal loss), both parents (double loss), or

neither parent. When a parent could not be identified as dead or alive, it was deemed unlikely that he or she played a role as either wage earner or care giver, two important parental roles identified in a study of orphanhood in Southern Africa [99]. While this may lead to overestimation of parental death, the implications for children's care remain the same [96]. A total of 125 fathers and 17 mothers were counted as dead in analysis, for this reason. (Please see Section B above, for further detail.) Respondents were asked to identify the adult or guardian who stays with and takes care of them at home. Possible answers included mother, father, both parents, grandmother, grandfather, both grandparents, and other relatives. In our analyses, living situation was classified as residence with both parents, father only, mother only, a non-parent adult, or no adult. A variable which described both orphan status and living situation was created. For females, categories included: both parents dead and live with a non-parent adult, both parents dead and live with no adult, father dead and live with mother, father dead and live with a non-parent adult, father dead and live with no adult, mother dead and live with father, mother dead and live with a non-parent adult, mother dead and live with no adult, parents alive and live with mother only, parents alive and live with father only, parents alive and live with a non-parent adult, parents alive and live with no adult, and the reference category, parents alive and live with both parents. For males, categories included: both parents dead and live with a non-parent adult, father dead and live with mother, father dead and live with a non-parent adult, parents alive and live with mother only, parents alive and live with a non-parent adult, parents alive and live with no adult, a combined category of any type of parental loss and live with no adult, a combined category of any males who live with their father only, and the reference category, parents alive and live with both parents. Males who experienced any type of parental loss and lived with no adult were combined because of the small number of younger males infected with HIV; each of these categories had similarly elevated odds of HIV relative to the reference category, by age. Males who lived with a father only

(whether their mothers were dead or alive) were combined because of the small sample size of males who lived with their father only; these categories had a similar age-specific pattern of odds of HIV infection.

Measurements: Confounding Variables. Age was the only confounding variable considered in this analysis, as described above for specific aim number 1.

Data Analysis: Univariable. Patterns of parental loss and living situation by gender and age were presented in graph format. The frequency of missing data for all variables of interest was examined. Variables for which more than 2 percent of data was missing were to be assessed to determine whether data was missing at random. However, there were no variables for which more than 2 percent of data was missing.

Data Analysis: Multivariable. Odds ratios measuring the strength of association between HIV infection and the combined variable describing parental loss and living situation were estimated by maximum likelihood. Odds ratios were the preferred measurement for these associations because the cross-sectional dataset did not allow measurement of HIV incidence rates. Clustering at the community level was taken into account in each model. Exposure to loveLife Y-Centres or clinics was assessed as a potential confounder, but inclusion of this exposure in the model did not alter the measured association between HIV and parental loss. The relationship between age and HIV status was graphically assessed and found to be close enough to linear for females and non-linear for males. Age was modeled with a linear spline for males [140].

A full model including terms for interaction between age and the combined parental loss and living situation variable was constructed for each gender. Sets of interaction terms were tested using the Wald chi-square test to determine whether they increased the fit of the model. Interaction terms that did not improve the fit of the model were removed using a backward elimination model-building strategy.

SPECIFIC AIM 3: DESCRIBE THE CONTEXT OF SEXUAL BEHAVIOR OF YOUNG PEOPLE WHO HAVE EXPERIENCED PARENTAL LOSS

This qualitative study explored the partnership behavior of adolescent orphans age 14 to 18 in order to understand possible reasons for their heightened HIV prevalence relative to the HIV prevalence of their non-orphan peers. Data from this study will be used in conjunction with survey data to inform the design of a peer group intervention targeting the specific HIV prevention needs of orphaned adolescents. Repeated focus group discussions were conducted with 4 groups of young people in one rural and one urban community in KwaZulu-Natal. A total of 54 individuals took part in focus group discussions. Based on availability and time constraints, 19 adolescents who volunteered for individual interviews were interviewed in order to supplement data collected in group discussions. The content of focus group discussion guides was informed by a preliminary look at the data collected in the 2002 survey described above. Therefore, design for this specific aim is best described as a principally qualitative study that is informed by the existing quantitative study. Where appropriate, qualitative findings have been added to enrich quantitative papers with descriptions of orphan partnerships in two KwaZulu-Natal communities, with the caveat that while qualitative findings are not generalizable, they provide insight into how orphanhood affects HIV risk of adolescents in certain settings. The third paper in this document presents qualitative findings using only those portions of the focus group discussion transcripts which pertain specifically to orphan youth. Future papers will make use of the entire body of qualitative data, including interview transcripts.

The following general research questions were addressed in the focus group and interview guides. (Please see the guides presented in the Appendices for wording. The questions below represent the research objectives, and do not represent how questions were sequenced or worded in the field, where the use of leading questions was avoided.)

- What are some of the ways in which being an orphan may affect age at first sex?
- What are some of the ways in which being an orphan could affect partner identity including partner's age?
- What are some of the ways in which being an orphan could affect power dynamics within relationships and HIV risk behavior?
- What are some of the ways in which risk behaviors differ by maternal, paternal, or double orphan status?
- What are some of the ways in which HIV risk behaviors differ for male and female orphans?

Study Setting. KwaZulu-Natal was selected as the setting for the study because it has some of the highest percentages of people infected with HIV in South Africa and the highest prevalence of orphanhood. Antenatal clinic data since the mid 1990s has found HIV prevalence in KwaZulu-Natal to be an average of 10 percentage points higher than at clinics in the rest of the country [141]. In 2002, the Nelson Mandela/HRSC national survey found that over one fifth of children aged 2 to 18 in the province had lost at least one parent [8]. For comparability with the survey, the KwaZulu-Natal orphan respondents interviewed live in high HIV prevalence communities that are sociodemographically similar to the KwaZulu-Natal communities where the survey data used in Specific Aims 1-2 was collected in 2002.

Study Population: Selection Criteria. Study subjects included 54 orphan and vulnerable Zulu adolescents aged 14-18 participating in focus group discussions in one urban and one rural community in KwaZulu-Natal, South Africa. Focus groups were stratified by gender and age. Based on the ages of those who volunteered to participate, youth were separated into older and younger groups, by gender (Table 3). Male focus groups met twice and female groups met three times for approximately one hour per session. There were between 4 and 7 participants in each focus group session. At the last meeting of each focus group, participants were told to sign up with a study team member if they were interested in being interviewed one on one.

Study Population: Recruitment. Study participants were contacted through two local community based organizations working with orphans who are supported by the orphan organization (NAME OF ORPHAN ORGANIZATION KEPT ANONYMOUS TO PROTECT PARTICIPANT CONFIDENTIALITY). (NAME OF ORPHAN ORGANIZATION) was established at the end of 2000 and provides food and psychosocial support to approximately 20,000 orphaned and vulnerable children living in 41 communities in the South African provinces of Kwa-Zulu Natal and Gauteng. Within each community, (NAME OF ORPHAN ORGANIZATION) works with community groups called “Arks” to provide services, which typically include the provision of one meal per day and monthly home visits to monitor the living conditions of each young person so that specific needs for assistance such as help with a child support grant or extra food parcels can be identified. In addition, Arks provide young people with activity programs including sports such as football or netball, choir, arts and crafts, homework sessions, and other educational programs. Ark meals and activities take place in Ark centers or in other community structures if an Ark does not have its own facility.

(NAME OF ORPHAN ORGANIZATION) agreed to collaborate on this study because of their interest in developing HIV prevention programs targeted to the specific needs of the orphan and vulnerable youth that they serve. They plan to develop a peer support group HIV prevention program for young people who want to talk about healthy relationship behavior and reproductive health. (NAME OF ORPHAN ORGANIZATION) would like to use the data generated through this qualitative work to inform the development of a peer based intervention for youth. (NAME OF ORPHAN ORGANIZATION) agreed to host this focus group study in one rural and one urban Ark in KwaZulu-Natal, and identified a total of three potential sites for the study based on scheduled activities at each Ark and the number of older youth who attended each Ark. In each area, a formal community entry process explaining the study to Ark leaders was followed. At each of the three Arks that were

approached for the study, Ark leaders were extremely interested in having the study at their Ark. The study took place at the first and third Arks approached. Though the second Ark wanted the study to take place there, there were not enough youth above age 13 attending the Ark on a daily basis to form focus group discussions, and a third Ark was selected by the (NAME OF ORPHAN ORGANIZATION) head office and selected instead.

Recruitment for the study took place at Ark facilities in each community using purposive, criteria-based sampling. While study recruitment materials specifically asked for orphan young people to participate, it was not feasible for ethical reasons to exclude vulnerable youth who are not orphaned, but also receive (NAME OF ORPHAN ORGANIZATION) services. Recruited participants included young people age 14 and older who receive (NAME OF ORPHAN ORGANIZATION) services because they had lost one or both parents or because they are vulnerable. Vulnerable youth included youth living with a parent who suffered from an illness such as HIV/AIDS or alcoholism, youth who had been abandoned by their father, and youth whose parents were unemployed or unable to work. Each young person above the age of 13 years attending each (NAME OF ORPHAN ORGANIZATION) centre was invited to participate in group discussions about sexual partnerships and HIV prevention with young people like themselves on a voluntary basis.

Collaborators at each Ark went through human research ethics training that stressed the fact that participation of young people in the study was voluntary and must not affect services they may or may not receive from an Ark in any way. In addition, collaborators were trained to protect the confidentiality of any youth who volunteered for the study. One to two weeks prior to focus group discussion meetings, a trusted community member informed young people at each Ark about the focus group discussions, which were presented as an optional activity for interested young people in an informal way, just as young people are informed about other Ark activities such as choir or sports. Interested young people were spoken to by a trusted community member who described the focus

group discussion guide in detail. Youth were assured that their participation in the study would be kept confidential. The study team asked young people aged 14 to 18 who are interested in taking part in the study if there was a parent, guardian, or adult caretaker who could give permission for their participation in the study, and for permission to contact that adult. Institutional review board approval was not given for the participation of young people without any caregiver.

Adults who were approached for the consent process were asked to come to the Ark. Those who were not able to attend the Ark meeting were visited in their homes. Verbal consent was sought and digitally recorded. Verbal consent was used because of discomfort with written documents in communities where the study took place. Young people aged 18 provided their own verbal consent, while young people aged 14 to 17 were asked for verbal assent after adult consent had been obtained on their behalf. A trusted community member read the verbal consent script to all young people as a group during the introduction of the study at each Ark. At the beginning of the first focus group, a focus group moderator read the consent script again, handed out a study information sheet, and recorded verbal assent from every young person still interested in participating in the study.

(NAME OF ORPHAN ORGANIZATION) is deeply concerned with protecting the rights of the vulnerable youth who receive their services and a verbal consent process was the only process acceptable to them as an authentic and non-coercive consent process. (NAME OF ORPHAN ORGANIZATION) believes that a verbal rather than a written consent process increases the comfort level of young people, ensuring that they feel absolutely free to decline to participate and that young people who do participate will participate only if they are motivated by interest in peer discussion of the focus group topics.

After participation in their second focus group discussion (for males) or third (for females), young people were given the opportunity to volunteer for individual interviews. Focus group participants were told that if they were interested in being interviewed about

their individual thoughts and experiences with sexual partnerships, they could let a member of the study team know. A verbal consent and assent process similar to that followed for focus group discussions was used for individual interviews.

Data Collection: Focus Group Discussions. A total of 8 groups of young people were convened for focus group discussions. Female groups met for 3 one hour focus group discussions and male groups met twice. A total of 54 young people who volunteered and gave verbal consent participated. Two male FGDs were scheduled because the range of male partner age differences is quite small; for females, partner age range is greater and it therefore took more time to explore the different types of female partnerships. Youth were encouraged to leave a focus group at any time if they were uncomfortable, and were told that they didn't have to answer any question if they did not want to. The composition of each group changed slightly over time, except for the urban younger males group, in which the same group of six boys was present for each of the two focus group sessions.

Focus groups were chosen as the primary methodology for this study because in the experience of the orphan organization (NAME OF ORPHAN ORGANIZATION), adolescent orphans feel more comfortable and less vulnerable in a group situation than they feel in individual interviews. In addition, group discussions around study topics were useful for familiarizing adolescent participants with group discussion around topics such as HIV prevention and reproductive health topics that may take place in (NAME OF ORPHAN ORGANIZATION)'s proposed peer support group intervention. Focus group discussions were therefore best suited to assist (NAME OF ORPHAN ORGANIZATION) in the development of peer support groups on these topics.

Discussions were moderated by field assistants in Zulu using a semi-structured focus group discussion guide. The guide outlined the general topics for discussion and also identified potential probes. The male assistant moderated male group discussions and the female assistant moderated for female groups. Notes were taken by the PI and sessions

were digitally audio-recorded by each moderator. Following discussions, a meal was provided for participants. This was the only incentive respondents received for their participation. Discussions took place in (NAME OF ORPHAN ORGANIZATION) facilities in a closed room to ensure privacy.

During the informed consent and assent processes, participants were told that focus groups would meet up to three times over approximately three weeks. After each discussion, respondents were reminded that they could stop attending focus groups sessions at any time. At the last session of each focus group, respondents were told to let a study team member know if they were interested in being interviewed one-on-one.

Data Collection: Semi-structured Interviews. Interviews were completed with 19 volunteers, drawn from every focus group in each community. The purpose of the interviews was to complement focus group findings by exploring the context of sexual partnerships from an individual perspective in which personal experiences could be discussed. In addition, interviews offered the opportunity to further explore specific preliminary focus group findings from an alternate viewpoint. The identity and number of interview respondents was determined by study participant interest and time limitations. Repeated interviews were conducted when possible in order to improve rapport and the quality of data collected.

The format and content of interviews was guided by the interview guide with special emphasis on significant themes that emerged from ongoing review of focus group transcripts during field work. Interviews were semi-structured. Youth were encouraged to describe their experiences in their own words and at their own pace [142]. Interviews were exploratory in nature and enabled the study team to learn about young people's sexual relationships and partnerships from their point of view.

Field assistants (one male and one female) translated during interviews which were conducted by an English speaking interviewer (the Principle Investigator) with isiZulu

speaking respondents. The male assistant was present for translation during male adolescent interviews and the female assistant was present to provide translation during interviews with females. In some cases, respondents preferred to be interviewed in English and in such cases, the PI conducted, recorded, and transcribed interviews. At times, in order to interview more youth or to increase comfort during interviews, the male field assistant conducted interviews on his own, in isiZulu, without the presence of the PI. Audio recordings of all interviews were made. One recorded interview had to be discarded because, due to interference from an electric fan, the digital recording was of such poor quality that it couldn't be transcribed.

After the verbal informed consent process, the first interview with each respondent was conducted for approximately one hour. At the end of the first interview, if time permitted, respondents were asked whether they would be willing to be interviewed a second time approximately 5-7 days later and if so, interview time and location were discussed. The number of interviews and repeated interviews was limited by the study time line which mandated that data collection be complete by the middle of April, 2007. Three of the 19 youth were interviewed twice, and one particularly open and enthusiastic key informant was interviewed five times. Topics listed in the interview guide for sessions one and two which were not sufficiently covered were discussed in greater depth with the respondent who was interviewed five times.

Topics to be Explored. Focus group discussions explored HIV risk behaviors of adolescents, informed by the Proximate Determinants Model discussed above. Risks explored included the decision to have a boyfriend or girlfriend, the decision to have an older partner versus a younger partner, the initiation of sex, and not using condoms. In order to protect the privacy of participants, focus group discussions explored community norms rather than the behavior of individuals. Scenarios addressing the risks described above were used to guide discussions. Each situation was tailored to the age group of focus group

participants. For example, 14-16 year old girls were asked about scenarios involving 15 year old girls.

Partner ages for each scenario were determined based on data from the 2002 RHRU community survey. Scenarios explored older and younger partnerships within each age group. The age of younger and older partners was determined by the age closest to the upper and lower 5th percentile of partner ages for females. This measure coincided with a partner age difference of 6 or more years for female orphans aged 15 as recommended by Luke and Kurz's review. However, partner age difference of 7 or more years was used for 18 year old females because of higher partner age differences among older females. For males, partner ages were determined by the age closest to the upper and lower 10th percentiles of partner ages because the range of partner ages for males is so much smaller. Please see Table 4 for a detailed explanation of partner ages chosen for each scenario. Guides for focus group discussions are included in the Appendix. Ages of the characters in each scenario were adjusted downwards in focus groups with a younger average age than planned for.

Focus groups first discussed scenarios which did not mention orphanhood. At the end of each focus group, young people were asked to discuss the scenario if the young person involved had lost one or both parents. This topic was introduced as follows, in one focus group discussion guide: "Now we would like to ask you about how the family situation of young people may affect their partnerships. Let's go back to the situation of Noma and Maxwell. We haven't talked about whether Noma's parents are living, and whether or not she is staying with them. If Noma's parents have passed away and she is living with her Grandmother, how could this affect her relationship with Maxwell? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face." Please see the Appendix for complete focus group discussion guides.

Interviews explored sexual relationship characteristics from the perspectives of orphan and vulnerable youth as they begin to negotiate partnership formation and sex. Youth were asked about the different types of sexual relationships among youth in general, and among orphan youth. Respondents were asked about the different types of sexual partnerships that adolescents in their community engage in and characteristics of each partnership type such as who initiates the relationship, how and where partners meet, how partners decide to have sex, gender roles within partnerships, length of relationships, and condom use. In addition, respondents were asked about their personal experience with each type of partnership and their thoughts about HIV risk. Respondent's experiences in their communities, at school, and at home, and their relationships with caretakers, parents, and friends were also explored if time permitted.

The interview guide is also included in the Appendix. The guide focuses on several areas of inquiry and includes a lengthy series of possible probes after each main question. The guide was created for ethical review purposes in order to show the full range of possible topics that could conceivably come up during interviews for the benefit of ethical reviewers. The actual interviews were respondent-guided and each interview included only a small subset of the topics listed, beyond initial questions about each respondent's family situation.

Data Management. Focus group discussions were recorded with a digital tape recorder, translated into English from isiZulu if necessary, and transcribed into Microsoft Word by the PI. Translations and some transcriptions were completed by one of the two field assistants or by a Zulu researcher with over ten years of qualitative research experience in reproductive health in KwaZulu-Natal. To insure quality, the first three discussion translations and transcriptions by field assistants were checked by the independent Zulu-speaking researcher described above. Interviews were recorded with a hand-held digital tape recorder and written notes were taken by the PI. English translations within each interview were transcribed into Microsoft Word by the PI or by one of the two

field assistants. The original research plan was that the first 3 interviews and every fourth subsequent interview would be translated into English a second time by field assistants to ensure the quality of translation that took place during the interview and to ensure that everything that a respondent said was translated, rather than rely on live translations during the interview. In practice, every interview was fully transcribed to ensure that everything a respondent said was translated.

Data Analysis. Focus group discussion transcripts from this study were coded and analyzed using the qualitative data analysis software package Atlas.ti. An initial set of topical codes was constructed from the focus group and interview guides (for example, “expectation of female behavior with older male partner”, “expectation of female behavior with similar age partner”, etc.). Other codes used in data analysis came from the data itself.

Themes that emerged during an initial reading of all of the transcripts were identified and used for coding lines of text in each document. These codes included “boy calls a girl to visit”, “concurrency”, “bright future”, “really love each other”, and “support the baby”, for example. The complete focus group code book is included in the Appendix to this document. Interviews have not yet been fully coded but coding will follow the same procedure used for coding focus group discussions and will likely include many of the same codes used for focus group data. Analysis of focus group discussion transcripts will be more structured due to the more structured discussion format in which respondents will be asked to discuss aspects of specified scenarios.

Similarly coded blocks of text from different transcripts were compiled for comparison. Analysis to date has focused particularly on focus group text that referred specifically to orphan youth. In future, key relationships and patterns will be identified in order to construct a model depicting the different types of sexual partnerships that male and female adolescents engage in and the steps that lead to their involvement in these partnerships. For interviews, rather than imposing a theoretical framework on the data,

theory linking adolescent's sexual behavior and partnerships with their experiences as orphans will emerge as a product of data analysis.² Further analysis of findings from focus group discussions will be less open-ended and will focus on understanding adolescent perceptions of risk behaviors and the influence of orphan status on risk behaviors.

² References used to guide the process of coding, data analysis, and theory development will include [142. Bernard, H.R., *Research Methods in Anthropology*. 2002: AltaMira Press, 143. Strauss, A. and J. Corbin, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. 1998: Sage Publications, 144. Ulin, P.R., E.T. Robinson, and E.E. Tolley, *Qualitative Methods in Public Health: A Field Guide for Applied Research*. 2005: Family Health International.

CHAPTER 5

RESULTS

PAPER 1: PARENTAL LOSS AND HIV INFECTION AMONG YOUNG PEOPLE IN SOUTH AFRICA

Young people in South Africa experience some of the highest levels of HIV infection in the world. In a nationally representative sample of 15 to 24 year olds in 2003, 15.5% of females and 4.8% of males were infected [145]. In 2006, 13.7% of teenage women and 28% of young women aged 20-24 attending antenatal care clinics in South Africa were infected with HIV [4]. Because of the HIV epidemic, young people in South Africa are burdened by an extremely high prevalence of parental loss. Estimates vary slightly, but between 20 and 25% of 15-18 year olds [7, 8] and over 27% of 15-24 year olds [9] have lost a parent. Over 15% of 15 to 24 year olds had lost one or both parents because of AIDS in 2005 [7]. Orphan prevalence is expected to continue to grow well after HIV incidence in South Africa peaks; one model predicts that by 2015 over 35% of 17 year olds will be maternally orphaned [10].

Adolescents and young adults who have lost a parent experience heightened vulnerability to HIV infection in many settings. Maternally orphaned female adolescents in Zimbabwe [126, 132, 134] and females 15-24 who have lost either parent in South Africa [9] experience higher HIV prevalence than their peers who have not lost a parent. Other South African surveys have found no association between parental loss and HIV [9, 94, 157].

Parental loss is associated with risky sexual behavior among young people in South Africa [10, 51, 81] and elsewhere [115, 123, 134]. In South Africa, the experience of

parental death is associated with having ever had sex, with earlier age at coital debut, and with decreased discussion of condom use [11, 16, 17]. Males with a deceased parent are less likely to have used condoms the last time they had sex and females with a deceased parent are more likely to have had multiple sex partners within the past year [9].

Many of the disadvantages experienced by youth who have lost a parent are contextual risk factors for HIV infection among adolescents, such as poor psychosocial adjustment and functioning, lower educational achievement and poverty. Poor psychological adjustment is associated with orphanhood throughout sub-Saharan Africa [134-136, 140, 145-148, 178-180] and in turn with increased HIV risk among young people [35, 45, 46]. Lower educational attainment, experienced by orphans throughout sub-Saharan Africa [132, 164, 181], is associated with increased HIV risk in a variety of African settings [65, 66, 70, 71, 182] including South Africa [35, 183]. Lastly, poverty plays an important and complex role in HIV risk, particularly for African women [18, 73, 77, 182] and female adolescents [52]. Endemic poverty shapes the experiences of most orphans in Sub-Saharan Africa [130, 131, 143, 184, 185] and in South Africa [9, 127, 128] and motivates young women to form partnerships with older men who are more likely to be infected with HIV than partners of their own age [13].

Measuring the increased HIV risk experienced by South African young people who have experienced parental death is important for appropriately targeting HIV prevention research and programs to this large and growing group. This study measures the association between HIV prevalence and parental loss in 33 high HIV prevalence communities from all 9 provinces in South Africa. In addition, our study examines the effects of gender and age on the association between parental loss and HIV, a necessary preliminary step towards understanding the causal pathways through which HIV risk may be elevated for young people who lose their parents. This study is the first we are aware of to simultaneously assess the association between HIV infection and type of parental loss by

gender and age.

METHODS

Data were collected in 2002 by the Reproductive Health and HIV Research Unit (RHRU) of the University of the Witwatersrand, as a baseline evaluation of the impact of the national South African HIV prevention program loveLife. The loveLife evaluation is a quasi-experimental, community-based, controlled, repeated cross-sectional study. In the 2002 survey dataset used in our analyses, young people were interviewed in 33 communities throughout South Africa to obtain baseline measures of the prevalence of infection with HIV and STDs, as well as the prevalence of related risk behaviors [20]. Communities in 11 health districts within the 9 provinces of South Africa were selected based on the location of loveLife Y Centres, located in black peri-urban townships or rural areas. Within the same health district, an additional community with a loveLife National Adolescent Friendly Clinic Initiative (NAFCI), and one control community (with a standard government clinic) were selected so that baseline HIV prevalence would be as similar as possible between Y Centre, NAFCI, and control communities.

Clusters of 54 households were randomly sampled from census enumeration areas within a 2 kilometer radius of the Youth Centre, National Adolescent Friendly Clinic, or government clinic in each of the 33 communities. Each household in the sampled clusters was visited and a list of all household members and their ages was created. Using this list, one young person aged 15-24 was randomly selected per household as a potential survey respondent. Respondents were asked to respond to an interviewer administered survey and to provide biological specimens to test for HIV, *Chlamydia trachomatis*, and *Neisseria gonorrhoeae*. Detailed description of the survey methodology is available elsewhere [20]. The questionnaire was an extensive battery of over 250 questions selected through review of international and South African surveys of youth sexual behavior and attitudes and

measurements of loveLife exposure [20]. The final sample included survey data from 8,749 respondents. Fifteen percent of young people approached in person for an interview refused to participate or had a parent or guardian refuse on their behalf,. In addition, 15.5% of respondents who were selected from a household roster to be interviewed were not found at home after three or more interviewer visits. Oral fluid samples were collected using the Orasure HIV-1 Specimen Collection Device from Orasure Technologies Incorporated in Bethlehem, PA and were tested using the Vironostika Uni-Form II HIV-1/2 plus O MicroElisa System from Biomerieux in Durham, NC. Individuals whose fluid samples tested positive for antibodies to HIV-1/2 were considered to be infected with HIV. HIV test results are available for 8,657 young people.

Data analysis. The outcome of HIV infection was assessed by exposure to parental loss as a binary variable contrasting loss of any parent with loss of neither parent. In addition, the HIV prevalence of young people who lost a mother, a father, and both parents was compared with prevalence among young people who lost neither parent. When a young person did not know if his or her parent was alive, it was deemed unlikely that the parent played a role in his or her life as either wage earner or care giver, two important parental roles identified in a study of orphanhood in Southern Africa [99]. In these cases, 125 fathers and 17 mothers were counted as dead in analysis. While this may lead to overestimation of parental death, the implications for children's care remain the same [96].

Separate male and female models were constructed for each analysis because of the very different pattern of HIV infection experienced by males and females [145]. We used multiple logistic regression analysis to examine the relationship between HIV and parental loss by age. The first analysis looked at loss of any parent, and the second considered loss of a mother only, father only, and loss of both parents. Models were assessed for goodness of fit using the appropriate form of Hosmer and Lemeshow's test [146].

Interaction terms for age and orphan status were included because of an *a priori* assumption that parental loss would have different repercussions for young people of different ages. Age was modeled as a restricted quadratic spline because of the nonlinear relationship between age and HIV infection. Important determinants of HIV risk such as socioeconomic status and educational attainment were not included in the models because they are likely to be on the causal pathway between parental loss and HIV infection. Analyses adjusted for clustering by community. Confounding by community exposure to loveLife or NAFCI programs was tested for in each multivariable model, but determined to be unnecessary in each case because it did not result in a change in the effect estimate of the association between parental loss and HIV infection.

RESULTS

Respondents were evenly distributed by age and gender. Fifty-five percent of the sample was female and mean age was 19 for both genders. Slightly over half were 15-19. Most respondents (94%) were black, 5.4% were colored (a term used in South Africa to describe people of mixed race who are primarily Afrikaans speaking and form the majority of the population in Western and Northern Cape provinces), and the rest were White or Indian. Twenty-nine percent of respondents were Zulu speakers and 29% spoke Xhosa. Other languages spoken at home included Sesotho, Tswana, Shangaan and Afrikaans.

Twenty-seven percent of males and 31% of females had lost one or both parents. Paternal loss was most prevalent (21.1%), followed by maternal loss (4.6%) and loss of both parents (3.5%). The prevalence of parental loss increased with age from 21% among 15 year olds to 40% among 24 year olds (Figure 5).

HIV prevalence rises at an especially steep rate for all females between ages 15 and 21, reaching 30% by age 21. Females under age 20 who had lost one or both parents had higher HIV prevalence than their peers while older females who had experienced parental

death had an HIV prevalence similar to their peers (Figure 6). For males there was no discernable trend. In unadjusted analyses, the odds of HIV infection among females 15-24 who had lost either parent were 1.28 times the odds of infection among females with living parents (95% CI: 1.13 to 1.45). For males, the relationship was similar with an odds ratio of 1.27 (95% CI: 1.04 to 1.56). When HIV prevalence was assessed separately for paternal, maternal, and double loss, the highest odds of HIV infection was found among young people of either gender who lost both parents (Table 5). Because the prevalence of parental loss and the prevalence of HIV increase dramatically with age, multivariable analyses which account for age are of greater interest.

We assessed the association between any type of parental loss and HIV infection by age using multiple logistic regression. Among females, the association between parental loss and HIV was particularly strong for 16 to 19 year olds (OR 1.26 for 19 year olds, 95% CI: 1.01 to 1.57), with no effect for older females. Among males below age 22, the odds of HIV infection were slightly greater for those who had lost either parent. The association between parental loss and HIV was strongest for the youngest males (15 year old male orphans had 1.45 times the odds of HIV infection of non-orphans age 15, 95% CI: 0.51 to 4.12). Measures of association were imprecise (Figure 7).

Further analysis examined the association between HIV infection and loss of only a father, only a mother, or both parents, by age. Females who had lost only their father experienced greater odds of HIV infection than those who lost neither parent from ages 16 to 21. Among 18 year olds, paternal orphans had 1.67 times the odds of HIV infection of non-orphans (95% CI: 1.20 to 2.31). Those females who had lost only a mother had higher odds of HIV infection than their non-orphan peers at ages 15 and 16 and slightly lower odds at older ages. Maternal orphans age 15 had 3.12 times the odds of HIV infection of non-orphan peers (95% CI: 0.89 to 10.92). Females who had lost both parents had higher odds of HIV infection than non-orphans below the age of 17 and above the age of 21. Double

orphans age 15 had 2.92 times the odds of HIV infection of non-orphan peers (95% CI: 0.81 to 10.48). Odds ratios for females were imprecise except for females who had lost their fathers (Figure 8).

Males who had lost only their father had similar odds of HIV infection than those who lost neither parent, at most ages. Maternal orphanhood among males was associated with higher odds of HIV infection particularly below the age of 19 (OR 3.06 for 16 year olds, 95% CI: 1.44 to 6.50). Males who had lost both parents had higher odds of HIV infection than their peers at ages 17 and above. Male double orphans age 18 had 2.24 times the odds of HIV infection of non-orphan peers (95% CI: 0.63 to 7.94). Unfortunately, odds ratio estimates were imprecise (Figure 8).

DISCUSSION

This study examined the association between HIV and parental loss among young people in South Africa, first measuring loss of any parent, and second, measuring separate categories of maternal, paternal, and double loss. The association between HIV infection and paternal loss differed by age and type of loss. While loss of any parent was associated with highest HIV prevalence, HIV prevalence was high among youth with living parents as well. The strongest associations between parental loss and HIV were apparent below age 20 among both genders and for all three types of loss. Parental loss in this age group is associated with increased risky sexual behavior in Zimbabwe [159] and with immediate increases in unprotected sex in the United States, where levels of sexual risk taking remain higher relative to non-bereaved peers over one year later [123].

Among older respondents of either gender, HIV infection was most prevalent among youth who lost both parents. Among males, maternal and double loss was associated with higher odds of HIV infection than paternal loss. Female maternal orphans had particularly elevated odds of HIV infection at ages 15 and 16. Among females who lost both parents,

HIV risk was highest among the very oldest and youngest respondents. Females with deceased fathers had the most consistently elevated and precise odds ratios of HIV infection. Prevalence of parental loss in this study (29%) was slightly higher than in a comparable national survey of young people conducted one year later (27%) [9].

National survey data in South Africa indicate that females 15-24 who have lost either one or both parents experience heightened odds of HIV infection relative to their peers (OR 1.25, 95% CI 1.08 to 1.44), and that there is a smaller and less precise association between male parental loss and HIV prevalence (OR 1.16, 95% CI 0.90 to 1.44) [9]. Overall, the results of this study are very similar. However, our results differ because we examine paternal, maternal, and double loss separately and because we assess the association between HIV and parental loss by age. Because most parental loss is paternal, collapsed measures of parental loss and HIV are heavily influenced by the association between paternal loss and HIV, and may fail to recognize associations between maternal or double loss and HIV, if they are present.

In another 2002 South African survey of youth, double orphans experienced the highest HIV prevalence, followed by maternal orphans, non-orphans, and paternal orphans. However, statistical tests concluded that there was no difference in prevalence between these groups [8]. Our study found that the overall level of HIV prevalence among respondents who lost both parents was not particularly different from that of maternal orphans among respondents below the age of 20.

Maternal death has an especially strong association with HIV infection among female Zimbabwean adolescents. In rural Manicaland, all vulnerable young women aged 15-18 (orphans, those with HIV-infected or seriously ill parents, and those living in a household that experienced a death in the past year) had higher levels of HIV prevalence than their peers. Odds of HIV infection were three times greater for those who lost a mother relative to those whose mother was alive [13]. Among 16-19 year olds in peri-urban Zimbabwe,

maternal loss is also associated with HIV infection [126]. Among 15-19 year old females in Highfield, Zimbabwe, loss of a mother or loss of both parents is associated with infection with HIV and/or HSV-2 [132]. In rural Zimbabwe, maternal loss is associated with early coital debut among 12-17 year old females [159]. Our study found particularly high levels of HIV infection among maternal and double female orphans around 15 and 16 years of age, although measures were imprecise. At later ages, the association between HIV infection and loss of a mother or both parents is attenuated.

Our findings provide limited support for previous studies linking residence with a mother and HIV risk among young women. In KwaZulu-Natal, females with dead or non-resident mothers had younger sex partners than those with resident mothers, though measurements of association were imprecise for those with deceased mothers [31]. In rural Zimbabwe, high risk sex was most common among paternally orphaned or vulnerable females 12-17. Maternally and doubly orphaned females had less high risk sex than non-vulnerable youth, though results were imprecise [159]. In our study, the harmful association between maternal loss and HIV infection disappears with age. This may be due to increases in HIV risk among the non-orphan comparison group, many of whom live with their mothers. Using sexuality as a commodity may be a learned skill; older adolescents are more financially successful in exchanges with male sexual partners than younger girls [17]. Some mothers may train their daughters to form advantageous partnerships with older men [147, 148], and girls without mothers may be slower to successfully incorporate these strategies. Sex is an increasingly important and complex part of the way women receive economic support in South Africa as agrarian and wage earning opportunities have collapsed [89].

Girls who live with their mother but not their father may also have greater risk of exposure to HIV through abuse by maternal sexual partners or boyfriends. Child rape victims in South Africa are six times more likely to be female, and 64% of victims are from

single-parent homes [149]. In 2003, only one third of all young people aged 10-14 lived with both parents; 31% lived with neither parent, 32.5% lived with their mother only, and 3% lived with their father only [11]. Together, these statistics suggest that most rape victims are likely to be females living with their mothers. Previous studies in South Africa have suggested parental absence is associated with child sexual abuse [70, 199]. Perpetrators of girl child sexual abuse are often mother's male friends or friends of a stepfather [150] and presence of a stepparent during childhood is associated with higher rates of sexual abuse [38]. South African males with a history of sexual assault have elevated HIV prevalence [151], further increasing the HIV risk of female victims.

Our study found a more moderate, yet prolonged and precise positive association between HIV and paternal loss among females aged 16 to 20 (Figure 8). Studies in Nairobi, the United States and New Zealand have suggested that fathers play a unique protective role in reducing risky sexual behavior of young females [51, 53, 172]. In KwaZulu-Natal, girls 14-24 who have lost their fathers or who do not live with their fathers have significantly older recent sex partners than girls with resident fathers [31]. Whether father absence is important because it covaries with familial and ecological stressors or whether father absence stands on its own as a special risk is not clear [35].

In our study, males who have lost only their fathers experience lower levels of HIV infection than those who also, or only, lost their mothers. Reasons for this are not immediately clear, as previous studies suggest that loss of a father, as well as loss of a mother, are associated with increases in risky behaviors for both males and females. In rural Zimbabwe, early sex is more common among males who lost a mother than among other orphans and vulnerable youth [136]. In KwaZulu-Natal, maternal and paternal orphans of either gender are more likely to have ever had sex and more likely to have had sex in the past year. However, the large increase in partner age among girls without fathers is not found among males [31]. One possibility is that males without fathers experience more

economic problems than other males and would therefore have trouble providing gifts that are often an integral part of sexual partnerships in South Africa [88]. Financially disadvantaged males may be more likely to partner with relatively younger females who have lower material expectations and lower HIV prevalence, or have less frequent access to sex, as has been suggested by a forthcoming qualitative study about orphan sexual partnerships in KwaZulu-Natal [147].

Limitations. This study assumes that HIV infections were not acquired through maternal to child transmission. In 2002, at the time of this survey, the South African government did not provide antiretroviral medication. It is highly unlikely that children infected by their mothers would have survived to the age of 15, the youngest age of respondents in our study. Mathematical modeling of the survival of HIV-infected children of HIV-infected mothers in African settings predicts 13% survival to age 10 years and 0% survival by age 15 years, if HIV is the only cause of mortality [152]. There is therefore a very small possibility that respondents may have been infected by their mothers at birth or through breastfeeding, resulting in a biased elevation in the association between maternal orphanhood and adolescent HIV infection. However, the survey was cross-sectional, making it impossible to know the temporal order of parental loss and HIV infection. Young people in this study were born from 1978-1987 and therefore very few of their mothers would have been infected with HIV to cause perinatal transmission. In 1990 in South Africa, estimated median HIV prevalence among pregnant women ranged from 0.6% in major urban areas to 0.4% outside major urban areas [153].

A small number of young people in this study had experienced maternal loss, were infected with HIV, and reported never having had sex. Below 18, prevalence of HIV among young people who have never had sex is higher for youth whose mothers are dead. For example, 1 of 24 (4.2%) males aged 15 and 1 of 17 (5.9%) females with dead mothers were infected with HIV, compared with 3.8% of males with living mothers and 4.9% of females

with living mothers. Among 16 year olds, the difference is larger; 4 out of 26 females whose mothers were dead but who reported not having had sex were infected with HIV, while only 18 out of 323 females whose mothers were alive but who reported not having had sex were infected.

These may represent a small number of survivors of perinatally acquired HIV, though we do not know if their mothers were infected with HIV. This small number of survivors of perinatal HIV infection may increase the association between HIV and orphanhood among younger maternally orphaned youth. For the great majority of young people in the study, though, HIV is most likely to be acquired through sexual transmission.

All young people, regardless of whether they reported ever having sex, were left in the model because of the high degree of under-reporting of sexual activity. Evidence for under-reporting of sexual activity is most evident among the youngest respondents in the sample – the same population in which we would expect to see perinatal infections. Social desirability bias is particularly strong among youth whose age is below the average age at first sex, leading to denial of ever having had sex. Sub-analyses of infection with *Chlamydia trachomatis* or *Neisseria gonorrhoeae* among youth who say they have never had sex show that 10% of 15 year old girls who are infected with HIV and who report that they have never had sex are infected with either CT or NG. Among 16 year old girls who are infected with HIV and who say they have never had sex, prevalence of CT or NG is 5%. In addition, young people who have experienced parental loss are probably more vulnerable to rape or sexual abuse; in these cases, respondents are likely to under-report sexual activity.

Each of the analyses presented in this paper was performed again on a subset of young people who reported having had vaginal or anal sex (66.5% of males and 71.4% of females), and results were similar. All young people were retained in the models presented in this paper because younger age at first sex is thought to be one important pathway through which orphans experience heightened HIV risk. Restricting analyses to youth who

had already become sexually active would therefore underestimate the association between parental loss and HIV prevalence.

Because the survey is cross-sectional, levels of HIV infection among young people born from 1978-1987 who died before 2002 cannot be measured. The exclusion of these infected young people is likely to cause underestimation of the association between parental loss and sexually acquired HIV infection among adolescents and young adults, given the study findings which suggest elevated HIV infection among youth who have lost a parent. The effect of perinatal HIV infection cannot be measured at all by this study, for reasons described above.

A further limitation is that due to the household sampling frame used in the study, youth who live on the streets or in child-headed households were not to be included. Our study therefore under-represents some of the most vulnerable young people in South Africa. If street youth and youth in child-headed households have higher levels of parental loss and HIV than other youth, then our estimate of the association between parental loss and HIV will be biased downwards.

Recently bereaved youth may have also been under-represented because of their higher rates of mobility. While mobility is high for all youth in South Africa, recent loss of a mother or father is associated with an almost 75% greater odds of mobility in the next two years, relative to youth who didn't experience parental death, among young aged 17 and younger in rural Hlabisa [109]. In rural Zimbabwe, mobility also increases after parental death, and is highest among older children [108]. In this study, 15.5% of the 12,655 respondents who were randomly selected to be interviewed from enumerated households could not be contacted because they were not found at home after three or more follow-up visits. In addition, an estimated 1,469 persons were missed because their households could not be enumerated in this study. These households may have been more likely to contain

orphans, because the instability brought on by death may increase likelihood that no one would be home for household enumeration.

Finally, it is possible that the survey under-represents young people who know they are infected with HIV and who may have specifically avoided taking part in the survey to avoid testing and talking about HIV risk behaviors. Fifteen percent of respondents who were contacted refused to participate in the survey.

CONCLUSIONS

Psychosocial distress caused by bereavement, the daily effects of non-residence with a parent (including lack of parental influence or guidance, supervision, and emotional support), and the material disadvantages arising from not having a parent are all important dimensions of parental loss that are likely to lead to specific increases in HIV risk behavior. Further research is needed to carefully explore these dimensions of parental loss and implications for multidimensional support for young people who have experienced parental loss. Our study focuses on the overall association between HIV infection and parental loss, concluding that young people are affected differently according to their age and gender and the gender of parent lost. It seems likely that age effects arise because bereavement during a key developmental milestone or transition phase may particularly increase risk behavior. For example, bereavement during puberty is likely to have a different impact than bereavement as a young adult over age 20. How age at parental loss affects risk behavior is an important area for further research. In addition, bereavement may affect youth differently over the months and years after parental death as youth move from the immediate crisis of loss to long term adaptation to their new circumstances. Future analyses should explore the effect of recency of parental death as well as timing of parental death in the life course.

A second dimension of parental loss, non-residence with a parent or parents, is an important component of loss which also affects non-orphan youth. In South Africa, many young people who are not orphaned do not live with their parents. In this study, 23% of non-orphans aged 15-18 did not live with a parent. Residence with a father is especially rare. Over two thirds of all youth aged 15-18 did not live with a father. The heterogeneity of the non-orphan population in terms of their living arrangements should be kept in mind in future analyses that compare young people who have and have not experienced parental death. Our results suggest that parental loss is associated with elevated levels of HIV infection, particularly among adolescents below the age of 20. Adolescents aged 15-19 in South Africa are experiencing the onset of sexual activity in a country where HIV prevalence increases yearly. It is of great public health importance to create and target appropriate HIV prevention efforts to this population which includes so many orphans. Identification of the causal mechanisms through which orphanhood increases HIV risk is needed to develop effective prevention practices. The fact that loss of a mother and loss of a father have different effects indicates that programs should assess needs based on the type of parent lost.

PAPER 2: HIV INFECTION AND PARENTAL DEATH AMONG SOUTH AFRICAN YOUNG PEOPLE: TAKING LIVING SITUATION INTO ACCOUNT

Young people in South Africa experience some of the highest levels of HIV infection in the world, in a changing context in which growing numbers of young people experience parental loss and most do not live with both parents. In 2003, more than 21 percent of 10-14 year olds [11] and over 27 percent of 15-24 year olds [9] had lost a parent. Evidence of increased levels of HIV infection among orphans in southern Africa is mounting. Females who have experienced parental loss have higher HIV prevalence than their peers in South Africa [9] and in Zimbabwe, HIV prevalence is higher among female maternal orphans [13-

15]. Paternal, maternal, and double orphans of both genders in South Africa experience elevated levels of HIV between the ages of 15 and 19, though estimates are imprecise aside from female paternal orphans and male maternal orphans of certain ages [154].

While many young people who have lost one parent do not live with their remaining parent, non-residence with a parent is also extremely common among those whose parents are living. The 2003 South African Demographic and Health Survey found that only one third of adolescents aged 10-14 live with both parents. Overall, 31 percent live with neither parent, 32.5 percent live with their mother only, and 3 percent live with their father only [11]. In addition, household composition is changing over time, with a significant increase in the number of female-headed households [155]. The age at marriage is increasing in South Africa [23], and more than one third of married couples live apart [156]. A minority of orphan and non-orphan youth in South Africa live in homes headed by their fathers [156]. In KwaZulu-Natal, 35.8 percent of 14-24 year olds live with both parents, 3.8 live only with their father, 29.3 with only their mother, and 31.1 percent with neither parent [30] and in Cape Town, the average black 15 year old spends less than half of his or her life with both parents [34]. Many South African youth experience substandard education and high rates of poverty, violence, and crime [43-47]. Resiliency to these environmental stressors is likely to be compromised by a lack of parental guidance from resident fathers in particular [33], due to paternal death and the living arrangements of young people whose parents are living.

Non-residence with a parent or parents is associated with risky behaviors such as a greater likelihood of ever having had sex [30] and partner age difference [31] among South African young people. Supportive parental relationships are associated with adolescent health behaviors and youth from disconnected or poorly functioning families are at increased risk for adverse health outcomes [28]. Orphans, in addition to experiencing non-residence with a parent or parents, also experience material [8, 100, 101, 103, 104, 128, 157-160] and psychosocial disadvantages [106, 107, 111, 113-116, 161-164]. These dimensions of

orphanhood are likely to increase orphan HIV risk behaviors already heightened by the psychosocial affects of bereavement [123]. Resiliency after parental bereavement is likely to be compromised by factors such as poverty, chronic stress, crowding, violence, and crime [28] and absence of the parent-child relationship [62, 63].

This paper assesses the HIV risks of young people in the context of parental death and non-residence with parents that is experienced by most South African young people. The goal of our analysis is to further understand the relationship between parental loss and HIV infection by examining the association between living situation (with a parent, other adult, or no adult) and HIV infection for young people who have and have not experienced parental loss. This study is the first we are aware of to assess HIV prevalence by parental loss as well as living situation.

METHODS

Survey Methodology. This study utilizes data from the Reproductive Health and HIV Research Unit (RHRU) 2002 Community Survey, a quasi-experimental, community-based, controlled baseline evaluation of the impact of the national South African HIV prevention program loveLife. Young people aged 15 to 24 were surveyed in 33 communities in 11 health districts within the 9 provinces of South Africa to obtain baseline measures of the prevalence of HIV, *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and related risk behaviors [20]. The survey methodology is summarized below, and described in detail elsewhere [20].

Eleven communities with loveLife Youth Centres (Y-Centres), typically located in black peri-urban townships or rural areas, were selected for the survey. Subsequently, within the same health district as each Y Centre community, one community with a loveLife National Adolescent Friendly Clinic Initiative (NAFCI), and one control community (with a standard government clinic) were selected. Communities within the same health district

were selected so that HIV prevalence would be as similar as possible across all three types of study site at baseline.

All enumeration areas within a 2 kilometer radius of each Y-Centre, NAFCI, or government clinic were selected in each community. Clusters of households within each EA were randomly sampled and all households within each sampled cluster were enumerated. One young person aged 15-24 was randomly selected in each household and asked to participate in the study. Respondents were asked to complete an interviewer administered survey and to provide oral fluid samples to test for HIV and urine to test for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.

The questionnaire included over 250 questions measuring sexual behavior and attitudes and measurements of loveLife exposure [20]. Fifteen percent of respondents whose names were selected from the household roster for an interview did not consent to be interviewed and 15.5 percent whose names were selected were not found at home after three visits. A total of 8,749 young people participated, and 8,657 HIV test results are available. Oral fluid samples were collected using the Orasure HIV-1 Specimen Collection Device from Orasure Technologies Incorporated in Bethlehem, PA and were tested using the Vironostika Uni-Form II HIV-1/2 plus O MicroElisa System from Biomerieux in Durham, NC. Fluid samples which tested positive for antibodies to HIV-1/2 were considered to be infected with HIV.

Data analysis. The outcome of HIV infection was assessed by exposure to parental loss and living situation. Young people were characterized as having lost either a mother or a father (maternal and paternal loss), both parents (double loss), or neither parent (no loss). When a parent could not be identified as dead or alive, it was deemed unlikely that he or she played a role as either wage earner or care giver, two important parental roles identified in a study of orphanhood in Southern Africa [99]. While this may lead to overestimation of parental death, the implications for children's care remain the same [96]. A total of 125

fathers and 17 mothers were counted as dead in analysis, for this reason. Young people were asked to identify the adult or guardian who stays with and takes care of them at home. Possible answers included mother, father, both parents, grandmother, grandfather, both grandparents, and other relatives. In our analyses, living situation was classified as residence with both parents, father only, mother only, a non-parent adult, or no adult. Males who had lost any parent and who lived with no adult were placed in the same category because of the small number of younger males infected with HIV; each of these groups had similarly elevated odds of HIV relative to males living with both parents, by age. Males who lived with a father only, whether their mothers were dead or alive, were combined because of the small sample size of males who lived with their father only; these groups also had a similar age-specific pattern of odds of HIV infection.

Because males and females experience very different age specific levels of HIV infection, separate male and female models were constructed. We used multiple logistic regression analysis to examine the relationship between HIV and parental loss and living situation by age. Models were assessed for goodness of fit using the appropriate form of Hosmer and Lemeshow's test [146].

Interaction terms for age and parental loss/living situation status were included because of the different association between parental loss and HIV among young people of different ages [154]. The relationship between age and HIV infection was nonlinear for males, and therefore age was modeled as a linear spline. For females, the relationship between HIV infection and age was fairly linear and age was included as a continuous numeric variable. Determinants of HIV risk such as socioeconomic status and educational attainment were not included in the models because they are likely to be on the causal pathway between parental death and HIV infection. Analyses adjusted for clustering by community. Confounding by community exposure to loveLife or NAFCI programs was tested for in each multivariable model, but determined to be unnecessary in each case

because it did not result in a change in the effect estimate of the association between parental loss and HIV infection.

RESULTS

Approximately 1 in 4 young people lived with an adult other than a parent in this study, and not living with a parent was common regardless of experience of parental death. Among young people aged 18 and under, 23 percent of non-orphans, 32 percent of those whose surviving parent was a mother, and 65 percent of those whose surviving parent was a father did not live with a parent. Most youth aged 18 and under (67 percent of males and 70 percent of females) did not live with a father. Younger youth living with a non-parent adult were most likely to live with a grandparent (64 percent of 15 year olds living with a non-parent adult) and most older youth living with a non-parent adult lived with another relative (66 percent of 24 year olds). Very few young people in the study lived with no adult guardian (4 percent of 15 year old boys and less than 1 percent of 15 year old girls). By age 24, 17 percent of males and 32 percent of females lived without an adult.

Most young people whose mothers were alive lived with their mothers. Young people with living parents were most likely to live with their mother, followed by both parents, followed by another adult guardian. Less than 6 percent of those with living parents lived only with their fathers (Figure 9). While most males with dead fathers below age 20 lived with their mothers (65 percent), most males with dead mothers of all ages did *not* live with their fathers (72 percent). The oldest females with living parents were most likely to live with no adult guardian, while the oldest males with living parents were most likely to live with their mothers (Figure 9). Most older males who had lost only their father lived with their mother, while older females who had lost their father were equally likely to live with their mother or without a parent. The prevalence of parental loss and non-residence with one or both parents increased steadily with age.

Females. The association between parental loss, living situation and HIV differed by age and gender in multivariable models. For females, loss of a parent and living situation had the strongest association with HIV risk from ages 15 to 19 (Table 6). Orphans who did not live with any adult experienced the highest HIV risk, followed by non-orphans not living with any adult. For example, 17 year old paternal orphans living with no adult had 8.38 times the odds of HIV infection of 17 year olds living with both parents (95% CI 3.38, 20.78). Among non-orphan 17 year olds living with no adult, the odds of HIV infection were 2.05 times that of those living with both parents (95% CI 1.18, 3.58).

After females living with no adult, HIV risk was highest among females with dead fathers aged 15 to 19 living with a non-parent adult or with their mother and females with living parents aged 15 to 19 and living with a non-parent adult. Relative to 15 year olds living with both parents, paternal orphans aged 15 living with a non-parent adult had 2.05 times the odds of HIV infection (95% CI 1.09, 3.85), paternal orphans living with their mother had 1.60 times the odds of HIV infection (95% CI 1.00, 2.57), and non-orphans living with a non-parent adult had 1.54 times the odds of HIV infection (95% CI 1.02, 2.34). Non-orphans living with their mothers had elevated odds of HIV infection from ages 16 to 18, with an odds ratio of 1.27 (95% CI 1.03, 1.56) at age 18 (Table 6). Young people with living parents who lived with their father, and young people who experienced maternal or double loss and lived with a non-parent adult had similar age specific odds of HIV infection though estimates were less precise.

Males. Among males aged 15 to 19, those with dead mothers who lived with a non-parent adult experienced the highest odds of HIV infection relative to those living with both parents (OR 5.49 at age 15, 95% CI 1.30, 23.15), followed by youth with living parents who lived with no adult (OR 3.30 at age 15, 95% CI 1.09, 9.94) (Table 7). Younger double orphans living with a non-parent adult and young people with any type of parental loss at all ages who lived with no adult had elevated odds of HIV infection relative to those living with

both parents, though estimates were imprecise. At almost every age, young people with living parents who lived with their mother or with a non-parent adult, those with living parents or a dead mother who lived with their father, and those with a dead father who lived with a non-parent adult had lower levels of HIV infection than males living with both parents. Most of these estimates were imprecise except for all males living with their father, who had less than half the odds of HIV infection relative to males living with both parents at age 19 and above (for example, all 19 year old males living only with their father had an odds ratio of HIV infection of 0.48 relative to those living with both parents, with a 95% CI of 0.24, 0.94).

DISCUSSION

Only 25 percent of young people in our study lived with both parents, while one third of 10-14 year olds in the 2003 South African DHS lived with both parents [11]. This difference is probably due to the older age of youth in our study. Unfortunately, data from the DHS on 15-24 year olds is not available for comparison. Our study suggests that non-residence with a parent or adult is an important risk factor for HIV for all young people. Males and females who did not live with an adult experienced the highest levels of HIV infection at most ages, although there were important gender differences in how living with no adult affected youth who lost a parent. While females with a dead parent who lived with no adult had a higher risk of HIV infection than females with living parents who lived with no adult, the opposite was true for males. Males with a dead parent who lived with no adult had a lower risk of HIV infection than males with living parents who lived with no adult. The difference in HIV risk by gender may be related to poverty associated with parental loss which can impede the formation of sexual partnerships by males with parental loss and encourage the formation of sexual partnerships by females with parental loss [147, 148].

Living with both parents was generally protective for females but not for males. Females with a dead father, whether living with a non-adult or non-parent adult, were worst

off. However, females whose fathers were alive but not in residence also experienced increased HIV risk, whether they lived with a mother, a non-parent adult, or no adult. Females living with their mothers had generally higher levels of HIV than those living with both parents or with only their fathers, although these comparisons lacked precision. In contrast, males who did not live with both parents experienced lower levels of HIV. At all ages, males who lived with only their fathers, males with living parents who lived with their mothers, and males with paternal loss or no loss who lived with a non-parent adult experienced lower odds of HIV infection relative to males living with both parents. For males aged 21 and older, only males with a dead parent who lived with no adult had elevated HIV levels relative to those living with both parents, though results were imprecise.

The protective role of living with a father that this study suggests for both males and females is consistent with findings showing that father absence is an overriding risk factor for early coital debut and associated risks in females in the United States and New Zealand [35], that childhood residence with father decreases sexual risk-taking for both genders in Cote d'Ivoire [36], and that father presence decreases the prevalence of sexual activity and unwanted pregnancies among females age 12-19 in Kenya [69]. In South Africa, males raised without a father are thought to be at increased risk of sexual abuse [37]. For both genders, lower rates of sexual abuse are found with presence of a father in the household, although results are imprecise [38].

Interestingly, the lowest odds of HIV infection for males in our study occurred among males aged 19 to 24 living with their fathers, who had roughly half the odds of being infected compared with males 19 to 24 living with both parents. Because residence with a father only is rare, it is possible that fathers who live with their young adult sons are unique in some way, perhaps sharing a particularly strong or positive parent-child bond which leads to prolonged cohabitation and healthier behaviors for their sons. Whether father presence is important because it is associated with decreased familial and ecological stressors or

whether father presence stands on its own as a special protective factor is not clear [35].

Exploration of the role of paternal residence is warranted in future longitudinal studies, particularly in South Africa where so many young people do not live with a father, in large part due to the continuing decline in marriage and cohabitation [67, 165].

The relatively strong association between HIV and paternal loss that is suggested by this study differs from the majority of recent findings in Zimbabwe, where loss of a mother is associated with HIV risk behaviors and HIV risk among females [126, 132, 134]. Paternal loss is hypothesized to have an economic impact which does not appear to affect HIV risk in the same way that maternal loss does, in that setting [126]. Loss of a father appears to impact the household financial stability and educational attainment of females, while loss of a mother is associated with HIV risk and risky behavior [126]. Likewise, in South Africa, the economic impact of paternal loss is hypothesized to affect school enrollment [105]. A recent qualitative study in KwaZulu-Natal suggests a strong relationship between poverty and HIV risk behaviors among orphan females [147] which may explain the association between paternal loss and HIV among females in our study. Cultural differences in the transactional nature of sexual relationships and gender power dynamics, played out within the different economic environments of Zimbabwe and South Africa, may explain the difference between the effect of maternal and paternal loss on females in these two countries which our study suggests. It is possible that relatively greater economic opportunities for men in South African fuel a sexual economy which is increasingly the only available source of income for women there [89], while in Zimbabwe, fewer economic opportunities for men may decrease the overall force of the sexual economy in women's lives.

The pattern of male HIV risk by parental loss and living situation differs in two important ways from the experience of females in our study. Firstly, in striking contrast with females, at most ages, males who live with both parents experience a higher level of HIV than males in other living arrangements, though our estimates are imprecise. Living with

both parents may be a marker for increased access to resources, which may place males at increased risk of HIV by allowing them to afford sexual partnerships in South Africa, in which transaction is hypothesized to play a crucial role [53, 88]. Secondly, maternal loss is particularly risky for most males in South Africa [154]; the majority of males who have lost their mothers aged 15-19 live with a non-parent adult, and they are one of the few groups who experience increased HIV risk relative to young people living with both parents. Parental control and family closeness are associated with having fewer sexual partners over time among adolescent males in the United States [27]. Young South African males who have lost their mothers attribute having more sexual partnerships to the fact that their mothers aren't there to warn them against such behavior [147]. Our study is the first we are aware of to find an association between maternal loss and HIV among males.

For females, in contrast, maternal loss is not as risky as paternal loss. While females with dead mothers experience elevated levels of HIV infection, estimates have low precision, in contrast to the consistently elevated and precise HIV risk found among girls who live with their mothers only. This may point to a partly detrimental maternal influence on age of daughter's sex partner [31] and other risk behaviors [159]. The fact that older adolescent girls are more financially successful in exchanges with male sexual partners [17] may indicate that these exchanges are a learned skill, and evidence from KwaZulu-Natal suggests that some mothers encourage their daughters to form partnerships with older men for food and other resources [147]. In addition, girls living only with their mother may be at increased risk of exposure to HIV through abuse by maternal sexual partners or friends [150] and presence of a stepparent during childhood is associated with higher rates of sexual abuse for all children [38]. Finally, young girls living with their mothers are likely to have more material needs than girls who live with grandparents who receive a pension, or those who live in households with both parents and are therefore more likely to have an employed member. Richter and Desmond have identified children living in households

headed by young adults or by single adults to be most vulnerable to hunger in South Africa [96].

Limitations. This cross-sectional study measures resident guardian identity only once and previous living situations are not described. Temporal relationships between orphan status, living situation, and HIV infection are unknown. There is a small possibility that respondents may have been infected by their mothers at birth or through breastfeeding, resulting in a biased elevation in the association between maternal orphanhood and adolescent HIV infection. However, at the time of this survey, the South African government did not provide antiretroviral medication. Mathematical models predict 0% survival of HIV-infected children of HIV-infected mothers, by age 15 years, if HIV is the only cause of mortality [152]. Because of low HIV prevalence among pregnant women when survey respondents were born between 1978 and 1987 and high levels of under-reporting of sexual activity, there are thought to be very few perinatally infected young people in this study [154]. All young people were retained in the models presented in this paper because younger age at first sex is thought to be one important pathway through which parental loss heightens HIV risk. Restricting analyses to young people who had already become sexually active would therefore underestimate the association between parental loss and HIV prevalence.

Because the survey is cross-sectional, levels of HIV infection among young people born from 1978-1987 who died before 2002 cannot be measured. The exclusion of these infected young people is likely to cause underestimation of the association between parental loss and sexually acquired HIV infection among adolescents and young adults, given the study findings which suggest elevated HIV infection among youth who have lost a parent. A further limitation of the cross-sectional study is that comparisons between young people of different ages are biased by temporal changes in HIV prevalence in South Africa over the past two decades and should be made with appropriate caution.

The household sampling frame used in the study excluded young people who live on the streets or in child-headed households. Although a small number of youth under the age of 18 who did not live with an adult guardian were interviewed, this study under-represents youth who do not live with an adult. Therefore, it is important to interpret our study findings that these youth experience some of the highest levels of HIV infection with caution. Youth under age 18 in this study who live with no adult may not be representative of all South African youth living with no adult, because we have no way of knowing how or why these youth were included in the study.

Recently orphaned youth may also be under-represented because of their higher rates of mobility. Recent loss of a mother or father is associated with increased mobility among youth below age 18 in rural Hlabisa [109] and among youth in Zimbabwe [108]. In addition, it is possible that youth who know they are infected with HIV may have specifically avoided taking part in the survey. Fifteen percent of youth who were contacted refused to participate in the survey. A lower representation of young people who lost a parent and those infected with HIV would cause our study to underestimate the association between orphanhood and HIV risk.

Lastly, this study doesn't examine the effect of identity of non-parent adult guardians such as grandmothers, aunts, siblings, or non-relatives, most of whom are female. There are likely to be important differences in adolescent HIV risk based on the age and identity of adult caregiver as well as the quality of relationship with a caregiver and caregiver ability to supervise and provide structure and discipline [147], nuances which this study does not take into consideration.

CONCLUSIONS

Our paper identifies residence with a parent as well as parental survival as important factors influencing HIV prevalence among young people in South Africa, whose HIV risks

are determined by their own gender in combination with the gender of their surviving or resident parent or parents. Further research should focus on developing prevention strategies to address the specific needs of South African youth at increased risk of HIV because of their living situation, as well as the related and particularly damaging experience of parental loss.

PAPER 3: THE CONTEXT OF ORPHAN SEXUAL PARTNERSHIPS AMONG ADOLESCENTS IN KWAZULU-NATAL

The HIV epidemic in South Africa creates a multifaceted burden for adolescents. All young people experience a high risk of HIV infection, and many lose their parents to AIDS. In 2006, 13.7 percent of teenage women and 28 percent of young women aged 20-24 attending antenatal care clinics in South Africa were infected with HIV [4]. Approximately 15 percent of 15 to 24 year olds have lost one or both parents because of AIDS [7] and over 27 percent of 15-24 year olds have lost a parent for any reason [9].

Parental loss is associated with higher HIV prevalence among maternally orphaned female adolescents in Zimbabwe [13-15] and females 15-24 who have lost either parent in South Africa [9]. Orphanhood is associated with risky sexual behavior in the United States [123] among young people who lost a parent to AIDS, in Zimbabwe [13, 159], and in South Africa, where the experience of parental death is associated with earlier coital debut and decreased discussion of condom use [11, 16, 17]. In addition, South African males aged 15-24 who have experienced parental death are less likely to have used condoms the last time they had sex. Female orphans are more likely to report having had multiple sex partners [9].

The material, emotional, and social disadvantages that orphan adolescents in South Africa experience are contextual risk factors for HIV infection among young people world-wide. These include poor psychosocial adjustment and functioning, which is associated with HIV risk [41, 50, 51] and with orphanhood [106, 107, 111, 113-117, 161-163, 166]. In a

number of settings in sub-Saharan Africa, orphans experience lower educational attainment [137-139], which is in turn associated with HIV risk in South Africa [24, 167] and elsewhere [14, 72, 76, 77, 193].

Finally, cultural practices such as large partner age differences in conjunction with gender power dynamics and the materiality of sexual relationships appear to place South African women, particularly those who are poor, at increased risk of HIV infection [58, 88, 89]. In many sub-Saharan settings, poverty appears to be associated with HIV risk particularly for women [24, 73, 79, 83, 193] and female adolescents [52]. Orphans in Sub-Saharan Africa experience greater poverty than non-orphan youth [9, 127-130, 143, 184]. This poverty motivates female adolescents in Zimbabwe to form partnerships with older men more likely to be infected with HIV [13].

Understanding the gendered context of sexual behavior and HIV risk for South Africa's large adolescent orphan population is important for appropriately targeting HIV prevention research and programs. This study is a preliminary exploration of the context of orphan sexual partnerships through focus group discussions with orphan and vulnerable youth in two KwaZulu-Natal communities in 2007.

METHODS

KwaZulu-Natal was selected as the region for this study because of its extremely high HIV prevalence and the fact that it has the highest prevalence of orphanhood in South Africa [8, 141]. One peri-urban community in the Durban area and one densely populated rural community approximately 50 miles away were chosen as study sites, based on accessibility to orphan adolescents attending after school programs in each setting. A total of 54 male and female orphan and vulnerable in-school adolescents aged 14-18 participated in focus group discussions (Table 8). Young persons aged 14 and older attending after-

school programs for orphan and vulnerable youth were invited to take part in the study. It was not deemed ethical to single orphans out for study participation, because each after school program offered services to vulnerable as well as orphan youth. Forty respondents (74 percent) had experienced the death of one or both parents. Double orphanhood was most common (24 youth), followed by paternal orphanhood (14 youth). Only 2 youth were maternal orphans. Twelve study participants were non-orphans identified as vulnerable because of poverty, abandonment, or difficult home situations such as parental alcoholism. There was no data on whether or not the remaining two participants were orphaned. The most common caretaker was a mother, followed by grandmothers and aunts.

Focus groups were chosen as the primary methodology for this study because orphans were expected to feel more comfortable in group research situations than in individual interviews. Discussions were moderated in isiZulu by a male or female research assistant, as appropriate, using a semi-structured focus group discussion guide. Focus groups were stratified by gender and age, based on the age of volunteers. In each of the two communities, separate focus groups were formed for older females, younger females, older males, and younger males, for a total of 8 groups. Each male group met twice and each female group met 3 times for approximately one hour each session, resulting in a total of 12 female and 8 male focus group sessions. While most of the same youth participated in each discussion, a few youth did not participate in every discussion. On average, groups contained 4 or 5 orphaned youth and 1 or 2 vulnerable youth. The average discussion session size was 5.8 youth (Table 9). The orphan or vulnerable identity of each participant is identified in transcripts for analysis.

Focus group discussions utilized stories about young people involved in partnerships with younger, same age, and older partners, and explored HIV risk behaviors such as partnership formation, partner age, sexual debut, and condom use. Each scenario was tailored to the age group of participants. For example, 14-16 year old girls were asked

about scenarios involving 15 year old girls. Partner ages for each scenario were determined based on data from the literature. Additional female scenarios were included because of the wider range of female partner ages. Surveys were translated into isiZulu by the two FGD moderators and then back-translated into English by a third Zulu study team member to ensure accuracy.

Each scenario about an adolescent relationship was first discussed without mentioning the economic and living situation or orphan status of the young person involved, and most sessions ended by exploring a variety of scenarios and living situations that included maternal, paternal, and double orphanhood. Because of time constraints, every group did not manage to cover all of the questions specific to orphan status. This paper is based on an analysis of focus group comments that specifically referred to orphans. Focus group comments describing the context of sexual partnerships for youth in general, without regard to orphan status, were not included.

Qualitative Data Analysis. Discussions were digitally recorded and subsequently translated from isiZulu and transcribed in English. Transcripts were coded and analyzed using the qualitative data analysis software package Atlas.ti (Version 5.2). An initial set of topical codes was constructed from the focus group and interview guides. Topical codes included “expectation of female behavior with older male partner” and “expectation of female behavior with similar age partner”, for example. Interpretive codes emerged from the data itself and included “peer pressure” and “pain/hurt of orphanhood” and were applied to all transcripts. Similarly coded blocks of text from different transcripts were compiled for comparison. Key themes, relationships, and patterns were identified.

Ethical approval for the study was obtained from the Institutional Review Board at the University of North Carolina School of Public Health and from the Medical Ethics Committee at the University of the Witwatersrand Medical School.

RESULTS

Analysis of focus group transcripts led to the identification of three main contextual factors in the lives of orphans which were relevant to orphan sexual partnerships and HIV risk behaviors. These factors are poverty, living situation, and psychosocial well-being. After an overview of these three emergent themes, male and female orphan partnerships are discussed below with reference to each of these themes.

Poverty. Focus group discussions consistently revealed the perception that orphan homes are affected by poverty. Young people of both genders in urban and rural areas discussed the lack of food and money experienced by orphans and the need to contribute to the support of their households. Youth explicitly and repeatedly mentioned the need for food.

Living situation. Both males and females reported that orphans are generally more likely to be able to do as they like and have more free, unmonitored time than other young people. This freedom may result from caregivers not caring about what orphan adolescents do, or from a caregiver such as a grandmother being unable or unwilling to enforce structure in the life of a young person. Several youth mentioned that orphans need to cook, clean, and assist their sick or elderly grandmothers. The second important conception of orphan family situations that emerged from discussions was that the loss of parental guidance resulted in riskier sexual behaviors for orphans.

Psychosocial distress. Young people of both genders reported that orphans often feel uncared for and may suffer unfair treatment from caregivers. Comments suggest that orphan young people experience a great deal of distress and feelings of worthlessness and the need to seek love, sometimes to make up for a lack of caring at home. Psychosocial distress was most often tied to the quality of living situations.

Female orphan partnerships in context. Poverty was the most highly emphasized motivation for orphan girls to have partnerships. According to respondents in this study, girls seek partnerships to satisfy their own material needs or desires. Sex in exchange for gifts or money, relationships with older partners who could provide those resources and peer pressure to have those resources were components of female orphan HIV risk that female respondents viewed as closely tied to poverty. According to a double orphan from the younger urban female group:

If I have parents, then we don't have money problems. Then, if you get everything at home, there is no need to have an older boyfriend.

Participant descriptions of female orphan economic situations often assumed females lived in female-headed households and focused on the need to care for and feed a sick mother or grandmother. The need to support others in their households leads orphan girls to have to sex, as described by a paternal orphan from the older rural male group:

That is why orphaned girls mostly end up as clown cash (prostitutes).

It was also reported that girls received encouragement to have sexual partners in order to be taken care of themselves. A younger rural female remarked:

Some mothers encourage their girls to have boyfriends, especially if there is no father at home, so that the boyfriend takes care of the girl.

Older partners can give a girl money to bring to school, money for clothes, food for her and her family to eat, clothes for a baby if a girl becomes pregnant, and can also assist their families, 'take care' of a girl, and 'buy her what she wants'. Comments from urban girls indicate that they are exposed to males with a higher economic status than males in the rural area; for example, having a car was a sign of wealth frequently mentioned in the urban area, while 'boys with cars' were not mentioned in the rural area. According to a double orphan from the older urban group:

Nonhlanhla can consider the fact that this person drives a car so, he is old, it can happen that he can give me all I want, so that I can fit in with my friends, cause no girl can accept that at home we live under these conditions, even if she is at home, she lies about her home, whereas she knows that at home there is only one shack, cause if she says exactly where her home is, they are going to laugh at her, cause they are all children, so Nonhlanhla can consider the offer from this elder partner so she can fit in with her friends.

Males also repeatedly and strongly indicated an awareness that orphan girls seek material goods from relationships with older men. A vulnerable older urban male described the situation at his school:

At school, girls who have boyfriends behave in such a manner that they only eat the fancy kind of food. For example, they don't eat the cheap food like Vetkoeks. This is because when you are the boyfriend you have to make sure that you give her money or buy her the expensive food like pizza or restaurant food. If you do not do it you will loose your girlfriend to older men who do not hesitate to buy for young girls. For example, at school, girls who are dating older people from outside the school environment are easily noticeable because they hang out together in different groups. They are very clean and neat. They always have new uniforms and carry the latest cell phones and the food they eat during breaks is really expensive. But if you look at these girls' home situation, you start wondering, because at home, they are extremely poor. But she gets these things from old men who have high jobs and flashy cars. The sad thing is that, at school, these same girls are in relationships with younger boys who they sometimes give money to. I often speak to girls and they explain to me about their lives.

Girls often reported that older men lure girls into relationships by initially saying they will not want to have sex, and then later demanding it. From a vulnerable female of the older rural girls group:

A girl can be poor and does not have even something to eat, because she does not have parents, and ends up accepting this man and the man will be giving empty promises like he will not be doing anything bad, he is going to wait for her until she finishes school and the girl will think that he is right. But at the end, he turns up against the girl.

While some girls also saw poverty as a reason to avoid sex, pregnancy, and motherhood, though overwhelmingly, comments focused on girls who did get pregnant and have a baby, urban and rural girls of all ages described pregnancy as a way to get assistance from the baby's father or his family, as did an unidentified younger rural girl:

But if she doesn't want to continue with school, she can purposely get pregnant hoping that her boyfriend's family would support her and the baby.

Peer pressure emerged as a major theme which interacts with poverty to encourage sexual partnerships among orphan girls. Girls described wanting to hide their own poverty from peers and desiring the material goods that their friends have in order to fit in, or because they would also like to have money to buy small food items at school. In the words of a double orphan from the older rural female group:

You can fall in love with a guy maybe because you do not have money to carry to school. Other children have money while you do not have anything. You feel bad when other learners are buying, and then you end up accepting the proposal so that you can get the money and buy good things.

Urban girls reported similar wishes to have what their friends have. In the words of a double orphan from the younger urban female group:

At school, maybe a boy asks you to keep his things, like his phone to play games, or his expensive things, his jackets, you see. Maybe he has got a golden tooth and they would say he is also going to have you get one, while lying to you. And others will be showing off the

things from their boys, and you end up wanting to do what they do.

Peer pressure is not always negative. Occasionally, girls reported that it can be a way of resisting having boyfriends, as indicated by a double orphan from the older rural female group:

There are good friends who counsel you and say “we are friends in this group; and you and me do not have boyfriends and let it be that way because we do not have parents, until someone comes to your home and requests your hand in marriage.”

Female orphans lack of guidance, monitoring and control at home was associated with HIV risk behaviors. While some mothers reportedly encouraged sexual partnerships for material support, other orphan girls reported that not having a mother to warn them about the dangers of being in a relationship left them vulnerable to choosing to have a boyfriend.

Another common theme was reluctance on the part of grandmothers to play the role of disciplinarian. In the words of a double orphan, part of the older urban females group:

With Mom, you are controllable because your Mom is strict, Gogo will always be soft, thinking that she is not your real Mom, (because) maybe you will think that she is abusing you. You can do anyhow. If you tell her that “Gogo, I will be back now”, you are going out to do homework with your friend, knowing very well that there is a golf (VW car) waiting for you at the corner of the road, and you go with your man. There is that looseness. Because in your eyes, what you do is right. Though your neighbors talk, (you think) at home they can’t beat me. What is the problem, cause if I fall pregnant, it will be me and not them, what is their problem?

Living with older caretakers like a grandmother was associated with female orphans behaving recklessly, as in the words of a vulnerable girl from the older urban girls group:

Girls staying with gogo, they don’t care, their friends even say that, “You at your home, you just do anyhow cause you have no mother, nor father, you just do as you like”, and she will say

that she is watching out for herself, she can't get the virus, and at the same time, you have bad luck and get a baby and a virus.

In contrast, mothers and fathers were generally felt to have much stricter control over a young person's time, as described by a vulnerable older rural female:

Some mothers beat their daughters, they scold them and control them. She can never have all the time she might have when staying with Gogo (grandmother).

Paternal control over free time was described by a double orphan, older rural females group:

(The girl in the scenario and her boyfriend) can be in love too much, as she can see that there is no person like a father who is going to watch out for her and beat her, not wanting her to go out at night.

Psychosocial need for love was cited again and again as motivation for a female to have a boyfriend. Rather than discussing their sorrow or other psychosocial distress as motivation for risky behavior, female orphan comments most often focused on the need to have someone to love, and to be loved by, to make up for the lack of love they have at home, or love that is missing from parents. From a paternal orphan, from the younger urban females group:

Because at home, she does not get enough love, and the situation is just bad, and they don't have money, so she would like to have someone in her life, someone she shares funny moments with, so she does not have a broken heart.

The need for love was cited by urban and rural girls in both age groups as motivation for having a boyfriend. A double orphan from the older rural girls group said:

You can fall in love with a man because you do not have a mother, just to get someone who is going to show you that he loves you.

Male orphan partnerships in context. Poverty was also a central factor influencing male orphan partnerships, although it affected male risk behavior very differently than it was said to affect female risk. According to a paternal orphan from the older rural males group:

When you are a teenage orphan living with an old person, like a grandmother, you assume the role of provider for the family, including your younger siblings.

Being impoverished was described as an obstacle to having a girlfriend because males felt they should not focus on girls, but instead should focus all their efforts on supporting their families at home. A typical response concerning “Jabulani”, a scenario male who is a paternal orphan living with his mother, from an older rural double orphan male:

Look, in all honesty, for someone in Jabulani’s social situation, a girlfriend or relationships should be something that is the least of his concern. He should be more worried about getting a job and supporting his family. He shouldn’t have a girlfriend, let alone two girlfriends. He should be doing people’s gardens when he is not in school and in school he should be doubling his efforts.

In addition, boys reported that being an orphan meant that they *should* use condoms because they don’t have the resources to take care of a baby. From a paternal orphan from the older rural males group:

I would expect both of them, since they are in that age group, to be really responsible especially around the issue of sex. Sure by now they understand the dangers of unsafe sex. Particularly Jabulani, because his social situation at home does not allow him to have a baby.

However, based on general discussions of condom use, it was clear that in most situations, boys probably don’t use condoms, because they either don’t really want to, or can’t get them.

Males also discussed wanting to hide their poverty, or simply not being able to afford or maintain a relationship. The shame of poverty was repeatedly raised by urban males and

was not mentioned by rural males. Several urban males did not want to have a girlfriend because they wouldn't want a girl to see their impoverished living situation at home. For example, an unidentified younger urban male said:

What I'm saying my brothers, is that there is no need for Jabulani to have a girlfriend. Let's say he has a girlfriend and doesn't explain his situation at home, but the girlfriend would like to visit him. When she gets to his place and sees the situation, she would say, "Oh, this is how you live in this family." Better that he doesn't have a girlfriend.

Others discussed the difficulty of having a girlfriend when they have no money and can't afford to give her presents. From an unidentified older urban male:

Firstly, she gets upset that you don't give her money. She feels you don't love her. If we go to town, maybe I ask her to pay for me, she would say, "This person is useless cos he doesn't have money". She will see guys who have cars and leave you.

Some males reported that it would be easier for an orphan guy to afford a relationship with a younger girl, because older girls want or expect more from a boyfriend. From a vulnerable older rural male:

His home situation has an influence because I would expect that his older girlfriend is someone who is at the stage where most girls like being given money, whereas Jabulani has no money to give this girl.

Moderator: So, you are saying that for the older girlfriend, he needs to have money. What about the younger girl?

No, he does not need to have money, she is easily impressed. Even if he gives her 10 Rands, she will be very happy.

However, monetary exchanges were not always from males to females. Both genders reported that girls give money to their boyfriends, if they have it and wish to do so. From an unidentified older urban male:

Some girls give you lots of money, like R50. They tell you to keep it, if you don't have money, you are hungry. You know this is your girlfriend, you do use the money.

Males reported that the lack of guidance experienced by orphans was a problem.

Males without an adult male figure lamented that they had no person to get accurate information from about sex and relationships, and so they rely on peers, as described by a paternal orphan, from the older rural males group:

The thing with boys like Thola who is now an orphan, there is no male figure to advise him on the safe ways and general norms of male sexual behavior, so most of what he will know about sexual behavior will be from friends, which are not always the right things. For example, things that encourage boys to have a lot of girlfriends are told by friends.

A mother's role was also described as important for males, by a younger urban male maternal or double orphan:

You know if your mother was alive, she would have told you not to go out with certain girls but now you are on your own, you don't care.

A double orphan from the older urban males group echoed this sentiment:

My mother really shouted at me and warned me never to get involved in relationships with girls, after she saw me with a friend of mine who was known to have a lot of girlfriends.

Some males reported that having parents decreased time available for sex, because young guys with parents were not left alone at home and therefore didn't have a chance to have a girlfriend over. However, most boys reported ample time and opportunities to have sex regardless of their living situation. Many young men have their own rooms with separate entrances, or know a friend whose room they can use.

Male psychosocial distress, related to poverty and unhappy living situations, was associated with risk behaviors in the words of many young men. Orphans not living with any

parent may feel as though no person cares for them, or about the choices that they make, or the risks that they take. This sentiment is exemplified by a double orphan, part of the older rural males group:

For being an orphan means that you do as you are pleased. In other words, there are not regulations or rules as to how you live your life. So you really are not accountable to any family norms and values. For example, if you are young and you want to start smoking, you can easily do that without anyone being concerned about your health.

Rural males from the older and younger groups each reported distress when caretakers use money that has been left for an orphan by his or her parents and spend it on themselves. These comments most often focused on the situation of a young person who had lost both parents. From a vulnerable male, part of the younger rural males group:

Someone who has no parents just decides by himself, he does not need to consult with anyone about important decisions. (An orphan feels) my life is just my life alone, no one helps me with anything anyway. Even relatives do not care about you. If you visit them, they tell you to leave when it is time to eat. Sometimes you find that they are eating the same money your mother left when she died.

Orphans reported experiencing intense sorrow and feeling valueless. Males related this feeling of worthlessness to risk taking. From a double orphan, part of the younger rural males group:

Maybe whatever he does, he would do it to occupy his mind not to think much about being an orphan and that he doesn't have food to eat. Maybe even if he does have sex, he would do it to forget about his sorrows. Sometimes orphans become reckless. They tell themselves that they are worthless and they are going to die anyway. People also take advantage of them. They eat veggies that people peed on in the field. They don't feel valued and as a result destroy their lives.

DISCUSSION

This qualitative study explored the context of orphan sexual partnerships through group discussions with orphan and vulnerable adolescents in two communities. Emergent themes with particular relevance for orphans included economic stress from living in households where they need to take care of or support other family members. In addition, orphans experience increased freedom from adult supervision when there is a lack of connection with caregivers or because caretakers are unable or unwilling to provide discipline, and psychosocial distress. Feelings of deep sorrow, worthlessness, and being uncared for were reported to lead to risk taking, recklessness, or needing 'someone to love' to replace a lack of love at home.

There is a great deal of overlap between the contextual risk factors for HIV experienced by orphans and those which affect all adolescents. Poverty in South Africa is heightened for households that have experience a death [9, 127-129], although it is a difficulty faced by most youth given the extremely high unemployment rate in South Africa. Females are particularly disadvantaged. In KwaZulu-Natal, African women aged 20 to 22 are less likely to have been employed, more likely to have fruitlessly searched for work, and more likely to have worked for a lower wage when employed [55]. The intensity of material exchanges from males to females in KwaZulu-Natal partnerships has been repeatedly documented among young people, regardless of orphan status [38, 86, 87]. The importance of these exchanges is growing over time as the number of female headed households increases and female employment opportunities continue to decline [89].

In addition, most adolescents in South Africa do not live with both parents. A 2002 household survey in all 9 provinces found that, among young people aged 15-18, 23 percent of non-orphans, 32 percent of those whose surviving parent was a mother, and 65 percent of those whose surviving parent was a father did not live with a parent [168]. Residence

with a father is especially rare. Among all youth aged 15-18 in this study, 67 percent of all males and 70 percent of all females did not live with a father. The heterogeneity of the non-orphan population in terms of their living arrangements should be kept in mind in future analyses that compare young people who have and have not experienced parental death.

Although most youth in South Africa don't live with both parents, orphans were perceived by youth in this study to experience particularly challenging circumstances such as living with adults who don't care about them, and as a result, to feel worthless and unwanted. Poor psychosocial health and lack of guidance and structure at home were the areas which appear to be most uniquely relevant to orphans, based on discussions in these two communities. The lack of supervision at home that orphaned young people reported here was also found among orphan youth in a 2002 household survey in all 9 provinces (see Appendix A). Problematic relationships with older caretakers have been noted in orphan populations in Kenya [169]. The large number of non-orphan youth who live with a grandmother in South Africa may have similar experiences, although their relationships are likely to be moderated in some way by their living but non-resident parent. This study revealed extensive orphan psychosocial distress resulting from living situations. A more balanced picture emerged from a qualitative study of orphan youth in Cape Town, who reported that caregivers may be a source of comfort or distress, depending on the quality of the caregiver relationship [164].

Psychosocial distress among orphans has been documented by a number of studies in sub-Saharan Africa [141-143, 148, 149, 152-155, 157] and is associated with HIV risk behaviors such as early coital debut among male and female maternal orphans in Zimbabwe [159] and with steep increases in unprotected sex and sexual risk taking among bereaved adolescents after parental death in the United States [123]. Cluver and Gardner conclude that bereavement is a key risk for emotional and behavioral problems among young people orphaned because of AIDS in Cape Town [164]. The qualitative findings

presented here reveal extensive distress among orphans who feel uncared for and lack structure and monitoring. Orphan feelings of worthlessness and a lack of guidance appear to remove disincentives to risky sexual behavior. Orphan psychosocial status also contributes directly to risk taking through acute emotional needs for love which lead to sexual partnerships. This study did not attempt to separately assess the effect of bereavement versus the effect of life changes that orphans experience after parental death. Future research on the multiple sources of orphan psychosocial distress would be useful for implementing comprehensive psychosocial support programs for orphan young people. Pressure from peers to have boyfriends, girlfriends, or sex has been noted in a number of studies in South Africa [84, 98, 200, 201] and was a major theme stressed by youth in the present study. This paper mainly discusses peer pressure experienced by girls, because it was described in focus groups as an important reason why orphan girls have sexual partnerships. Boys discussed peer pressure to have sex extensively, but did not mention peer pressure to have sex in the context of orphan sexual partnerships. The pressure that orphan girls receive from their peers to have boyfriends and the associated material benefits appears to be particularly acute because of their economic needs. Our study indicates that some mothers exert similar pressure on their paternally orphaned daughters.

The gendered effect of poverty on orphan HIV risk. Orphan exposure to poverty has a different effect based on gender. According to youth in this study, sexual partnerships are a solution to female orphan poverty, but not for male orphan poverty, because males are generally expected to provide material items to girls, rather than receive them. Orphan girls were said by all to be able to obtain food from boyfriends who have money. Males, on the other hand, mainly felt that they could support their families through employment doing 'piece jobs' such as lawn cutting or gardening. The only female employment option mentioned was prostitution. Both males and females made a clear link between girls wanting food and having sexual relationships. A recent study of orphan and non-orphan

HIV risk in Tanzania reached a similar conclusion: that money is protective for girls but that it increases male HIV risk [148]. Evidence from South Africa on this topic is ambiguous; one KwaZulu-Natal study suggests that the negative effect of poverty on sexual risk behaviors such as ever having had sex is larger for females than for males [31] while another found no connection between household wealth and sexual activity among adolescents of either gender [24]. The economic vulnerability of orphan females could explain why, in many studies, orphanhood appears to increase the HIV risk of females more than males [9, 126, 132, 134].

Our study indicates that poverty may decrease male orphan HIV risk by causing young men to feel that they cannot afford to make a girl pregnant and that they cannot afford to give the gifts that may be expected in a relationship. The lack of resources experienced by orphaned young men may also cause them to have partnerships with relatively younger females, who have lower material expectations from a boyfriend. Relatively poor young men in KwaZulu-Natal have partners approximately two years younger than they are, while wealthier males have partners who are only one year younger [31]. Given the steep increase in HIV prevalence among young women, poor males who partner with slightly younger females than their wealthy peers are likely to experience a lower risk of HIV infection.

Poverty, according to youth in this study, increases the HIV risk of orphan girls by motivating them to have sexual partnerships. In addition, this study strongly suggests that some girls are encouraged by their mothers to help support the family by partnerships with men which procure food or other goods for the household. In KwaZulu-Natal, girls 14-24 with resident mothers have older sex partners than girls with non-resident mothers [31]. In Tanzania, limited evidence suggests that female orphans living with their mothers are pressured to exchange sex for material resources [148]. Paternally orphaned girls living with their mothers may be at a greater disadvantage than non-orphans for economic

reasons, and mothers may actually assist them in negotiating relationships for material gain. National household survey data from South Africa indicate that children in households headed by young adults or by single adults are most likely to have experienced hunger in the past year, and that increasingly, orphan youth live in these most vulnerable households [96].

Youth in this study emphasized the importance of the role of material transaction in sexual relationships. It is possible that focus group discussions were biased toward discussion of the most extreme examples of sexual behavior. However, findings closely resemble reports from other KwaZulu-Natal studies [53, 88]. Estimates of the prevalence of transactional sex (defined as engaging in sexual relations in exchange for money or gifts) in South Africa vary from 2 percent [145] to 20 percent among young females and females of reproductive age [116, 117]. In the Eastern Cape, 18 percent of young men report giving material resources to sex partners [90]. Gender power imbalances in the context of the extreme income inequality found in South Africa may make transaction an especially fundamental part of some relationships, as suggested by a recent study of transactional sex in the Eastern Cape [90] and an additional study in KwaZulu-Natal [89].

Limitations. Participants were fairly well distributed by gender and urban or rural community. At each after school center site, the study was described as a study of orphan partnership and HIV risk behavior, but the study team accepted volunteers regardless of orphan status. Most sessions had between 5 and 7 youth. The largest discussion session had 8 participants. Attendance was particularly low in the younger rural boys group, which had 4 participants in the first session and 5 in the second session. There was a greater level of discrepancy in the level of orphan participation. Only 2 of the 6 older urban females in the study had lost a parent. In most cases, every speaker is identified and matched with his or her orphan status, but in some cases, this was not possible due to difficulty hearing the recording clearly.

Participants were supposed to be as alike as possible because of similar recruiting strategies implemented at each after school program. However, few adolescents above age 16 attended the urban after school center on a daily basis because of the far distance from there to the local high school. Therefore, some participants were recruited from a peer educator training program run by the urban after school center staff at a local high school. All 6 of the older urban males and 4 out of 6 of the older urban female participants were orphan or vulnerable youth in the peer educator training program. Although the older male and female urban youth were particularly vocal and active focus group participants, the themes which emerged from their groups were quite similar to those from younger urban youth. The most noticeable difference was the fact that the older urban males were more inclined to discuss their own personal experiences than any other group.

There were several possible sources of self-presentation bias in this study. One source of bias may have resulted from youth trying to give responses that they felt the focus group moderators would approve of. Secondly, discussions took place in private, but on the property of each after school center. Youth may have felt that they could get in trouble for having boyfriends or girlfriends, because these behaviors are actively discouraged by program staff and volunteers. To combat self-presentation bias, and to promote confidentiality, all youth were encouraged to discuss the thoughts and actions of youth presented in scenarios, rather than their own personal experiences. Females rarely discussed their own experiences, and none of them discussed having a boyfriend, although male participants occasionally discussed their own experiences with girlfriends. This may be due to secrecy around adolescent sexual partnerships in South Africa. In rural KwaZulu-Natal, young people engage in two main types of relationships, serious partnerships and more “modern” relationships without a commitment. Serious partnerships tend to be known by families of both partners. Non-committed relationships are considered a normal right of

passage for males, but not for females, who must keep these less serious relationships secret from their parents and community members [24].

Stigma. In each community, youth remarks about orphan sexual behavior were occasionally quite negative, possibly indicating stigmatized attitudes toward orphanhood. For example, an unidentified young rural female noted:

Orphans are problematic because they misbehave, because they know that they are orphans. Whenever those that are taking care of them try to discipline them, they would say they are treated differently because they don't have parents. They would say "Just because I don't have parents, you are treating me like this". They demand everything at the same time. They are ill-disciplined. They sleep around with boys.

Both male and female orphans mentioned the 'reckless' behavior of orphans, including sexual activity, that results from feeling no person cares about them.

Previous studies have noted that orphans in sub-Saharan Africa experience stigma [130, 142, 157]. This study also suggests stigmatized attitudes towards orphans, particularly in terms of their sexual behavior. When relationships were discussed without reference to orphan status, girls were much more likely to mention benefits of having a boyfriend, such as the ability to help each other with homework or to share in each other's hopes and dreams. It is not clear why orphan partnerships were judged so much more harshly. Because the nature of focus groups is to elicit norms, this study may emphasize negative orphan stereotypes that many youth in the study are aware of.

CONCLUSIONS

This study highlights poverty, unhappy or difficult living situations with uncaring caregivers, and the resulting psychosocial distress as important factors in orphan HIV risk. While most youth in South Africa experience poverty and do not live with both parents, the

psychosocial distress and lack of supervision described by young people in this study appears to be a widespread problem for orphans that leads to risky sexual behavior. In addition, this study points to important differences in the way poverty affects orphan males and females, heightening female exposure to sexual partnerships and possibly decreasing HIV risk among male orphans.

CHAPTER 6

CONCLUSIONS

RECAPITULATION OF OVERALL STUDY AIMS, FINDINGS AND DEGREE TO WHICH THE GOALS OF THE DOCTORAL RESEARCH HAVE BEEN MET

The goals of this dissertation were to describe the association between HIV prevalence and paternal loss (maternal, paternal, double, or no loss) among young people aged 15 to 24 by age and gender, to describe the association between HIV prevalence and parental loss among young people by age and gender in the context of living situation (residence with one or both parents, a non-parent adult, or no adult), and to qualitatively describe factors that influence orphaned adolescent sexual debut and types of sexual partnerships. These preliminary steps towards a comprehensive understanding of the gendered relationship between parental loss and HIV risk in South Africa have been accomplished.

SUMMARY OF 2002 SURVEY DATA FINDINGS: ORPHANHOOD AND HIV

Among young people aged 15-24 in South Africa, the strongest associations between parental loss and HIV were apparent below age 20. Relative to males with living parents, young men who had lost their mother or both parents had the highest odds of HIV infection in this study, although measures were imprecise. Males who lost their father experienced lower levels of HIV than males who lost their mother or both parents.

Among females, maternal orphans had particularly elevated odds of HIV infection at ages 15 and 16 compared to non-orphans. HIV levels among females who lost both parents

were relatively higher among the very oldest and youngest of respondents, and females whose fathers were dead had the most consistently elevated and precise odds ratios of HIV infection, relative to those with living parents. There was greater power to detect an association between HIV risk and paternal loss because paternal loss is the most common type of loss. In later adolescence, the association between HIV infection and loss of a mother or both parents was attenuated for females in our study.

Non-residence with a parent or parents is an important component of parental loss which also affects non-bereaved youth in South Africa. In this study, 23 percent of non-orphans aged 15-18 did not live with either parent. Residence with a father was especially rare. Over two thirds of all youth aged 15-18 did not live with a father. The heterogeneity of the non- bereaved population in terms of their living arrangements should be considered in analyses that compare young people who have and have not experienced parental death.

SUMMARY OF 2002 SURVEY DATA FINDINGS: PARENTAL LOSS, LIVING SITUATION AND HIV

The second aim of this dissertation study was to assess the association between non-residence with a parent or adult and HIV among young people who had and had not experienced parental loss. Males and females who did not live with an adult caregiver experienced the highest levels of HIV infection overall, although there were important gender differences in this effect for youth with parental loss. Among youth with parental loss, females living with no adult had a higher risk of HIV infection than those with living parents, but the opposite was true for males. Among males living with no adult, those who had lost a parent had a lower risk of HIV infection than those who had not.

Within every category of parental loss (maternal, paternal, double, and no loss), females living with no adult had a higher risk of HIV than those in any other living arrangement. Among females either living with no adult, living with a non-parent adult, or

living with a mother, those who had lost their fathers had the highest relative odds of HIV infection.

The relationship between parental loss, living situation, and HIV risk is more complex for males. For males at almost every age below the age of 20, living with only one parent was associated with a lower odds of HIV infection than living with both parents. Living with a non-adult was associated with HIV infection regardless of parental loss, and living with a non-parent adult was also associated with risk relative to youth living with both parents for males who had experienced maternal or double loss. Males living with a non-parent adult whose mothers were alive (whether or not their fathers were living) experienced lower odds of HIV infection than those living with both parents. For males below age 20, paternal orphanhood was generally protective relative to living with both parents. Maternal orphanhood was associated with increased HIV risk relative to living with both parents, unless a male lived with his father. Above the age of 19, every living situation among males, regardless of parental loss, was associated with lower odds of HIV infection than living with both parents, except for males who had experienced parental loss and were living with no adult.

SUMMARY OF 2002 QUALITATIVE FINDINGS

The qualitative portion of this dissertation study explored the context of orphan sexual partnerships through group discussions with orphan and vulnerable adolescents in two communities. Emergent themes with particular relevance for orphans included the economic stress that orphans experience from living in households where they need to take care of or support other family members. In addition, orphans experience increased freedom from adult supervision when caretakers are uncaring or are unable or unwilling to provide discipline. The unhappy living situations that can result from parental loss reportedly lead to feelings of deep sorrow, worthlessness, and being uncared for. In turn,

these symptoms of psychosocial distress were reported to result in risk taking, recklessness, and needing 'someone to love' to replace a lack of love at home.

Orphans of both genders experience economic and psychosocial disadvantages and difficult living situations. Living situations where there is a lack of caregiver supervision reportedly make it easier for both males and females to have sexual partnerships. Psychosocial distress appears to encourage risky behavior, such as engaging in sexual partnerships, for both genders. In addition, an increased need for love may motivate orphans to enter into relationships. Finally, both genders experience poverty, a responsibility to provide for family members, and desire to satisfy personal material needs and wants.

Exposure to poverty has a different effect based on gender. Our study indicates that poverty may decrease male orphan HIV risk by causing young men to feel that they cannot afford to make a girl pregnant and that they cannot afford to give the gifts that may be expected in a relationship. The lack of resources experienced by orphaned young men may also cause them to have partnerships with younger females, who have lower material expectations from a boyfriend. However, some orphan males may partner with girls who give them money that comes from partnerships with older men, leading to increased risk of HIV infection. Poverty, according to youth in this study, increases the HIV risk of orphan girls by motivating them to have sexual partnerships. In addition, this study strongly suggests that some girls are encouraged by their mothers to help support the family by partnerships with men which procure food or other goods for the household.

DISCUSSION

This dissertation identifies residence with a parent and parental survival as important factors associated with HIV infection among young people in South Africa, whose HIV risks are shaped by their own gender in combination with the gender of their surviving or resident

parent or parents. Qualitative data indicate that psychosocial distress and the lack of guidance experienced by youth who have lost one or both parents increase risky behaviors among both males and females, but that poverty, which increases HIV risk for females, is protective for males. Survey data suggest that loss of a father is harmful for females in particular, and that loss of a mother is harmful for both genders but is especially harmful for males. Gender of parent lost and young person affected, living situation, and age are modifiers of the association between parental loss and HIV infection. The following section compares findings from the qualitative and survey data portions of the dissertation and a review of applicable literature to interpret the complex relationship between gender, parental loss, and HIV risk among young people.

Loss of a father. Young people who lose a father are vulnerable to the psychosocial effects of bereavement as well as lack of guidance and supervision and loss of resources from paternal income. Paternal loss in Zimbabwe is hypothesized to have an economic impact which does not appear to affect HIV risk in the same way that maternal loss does. Loss of a father appears to impact the household financial stability and educational attainment of females, while loss of a mother is associated with HIV risk and risky behavior [126]. Likewise, in South Africa, the economic impact of paternal loss is hypothesized to affect school enrollment [105]. The qualitative paper in this dissertation suggests a strong relationship between poverty and HIV risk behaviors among orphan females which may explain the association between paternal loss and HIV found among females in our study. The relatively strong association between HIV and paternal loss that is suggested by this study differs from recent findings in Zimbabwe, where loss of a mother is associated with HIV risk behaviors and HIV risk among females [13-15]. Cultural differences in the transactional nature of sexual relationships and gender power dynamics, played out within the different economic environments of Zimbabwe and South Africa, may explain the difference between the effect of paternal loss on females in these two countries. It is

possible that relatively greater economic opportunities for men in South African fuel a sexual economy which is increasingly the only available source of income for South African women, as the number of female headed households increases and female employment opportunities continue to decline [70, 71]. In contrast, the extreme lack of resources in Zimbabwe may place constraints on material exchanges as part of relationships, rendering these transactions significantly less lucrative and therefore less attractive options for women there.

Our study suggests that the economic impact of losing a father is associated with increased HIV risk among females, particularly if they live with their mothers and are therefore economically vulnerable. Future studies should adjust for socio-economic status, something not well measured in this survey, in order to better understand this component of female orphan HIV risk. Females who have lost their fathers and are living with their mothers are likely to have access to fewer resources than those whose fathers are alive, given that females in South Africa are increasingly less likely to be employed [170]. In addition, national household survey data from South Africa indicate that children in households headed by young adults or by single adults are most likely to have experienced hunger in the past year [96] and in our survey population, young people living with only one parent are most likely to be living with their mother. Young women living with their mothers in poverty are likely to be at increased risk. The qualitative portion of this dissertation study has shown that some paternally orphaned girls are encouraged by their mothers to form advantageous partnerships with older men for access to resources such as food. Older adolescents are more financially successful in exchanges with male sexual partners than younger girls [17], indicating that using sexuality as a commodity may be a learned skill and girls without mothers may be slower to successfully incorporate this strategy. In KwaZulu-Natal, girls 14-24 with resident mothers have older sex partners than girls with non-resident mothers [31],

and in Tanzania, limited evidence suggests that female orphans living with their mothers are pressured to exchange sex for material resources [148].

Constrained access to resources appears to affect the HIV risk of male and female young people differently. Poverty reportedly impedes the formation of sexual partnerships among males who have experienced parental loss and encourages the formation of sexual partnerships among females who have experienced parental loss in the qualitative portion of this study. A recent study of orphan and non-orphan HIV risk in Tanzania reached a similar conclusion: that money is protective for girls but that it increases male HIV risk [148].

It is not clear whether father presence is important because it is associated with decreased familial and ecological stressors or whether father presence stands on its own as a special protective factor [35]. Father absence is a risk factor for early coital debut among females in the United States and New Zealand [35], childhood residence with a father decreases sexual risk-taking for males and females in Cote d'Ivoire [36], and residence with a father decreases the prevalence of sexual activity and unwanted pregnancies among female adolescents in Kenya [53]. Exploration of the role of paternal residence is warranted in future longitudinal studies in the South African context of decline in marriage and cohabitation [23, 67, 165], where so many young people do not live with a father, and where households are increasingly headed by females [155].

Loss of a father is not associated with HIV infection among males in our study. For male orphans, the risks associated with psychosocial distress and the lack of guidance that they experience may be outweighed by economic vulnerability which decreases their HIV risk. Economic adversity may protect males by lessening their ability to participate in material exchanges which are an integral part of sexual partnerships in South Africa [53, 58, 88, 89, 148]. The overall increase in HIV infection among males who live with both parents may be due to their greater access to resources. Perhaps the benefits from added

supervision and guidance that males who live with both parents receive are outweighed by the risk they incur through their greater access to resources.

Loss of a mother. Loss of a mother is associated with increased levels of HIV infection among both genders in our study, and loss of a mother may be particularly associated with psychosocial distress in the South African context, where mothers appear to play a more significant role in the lives of their children and most young people live in female headed households. A literature review revealed very little information comparing maternal and paternal roles in South Africa. A 2001-2002 study in the Durban area, in which 340 out of the 633 adolescents interviewed were black, indicated that both males and females identified more with their mothers than with their fathers, that mothers were more involved in the supervision of both male and female young people, and that young people of both genders perceived their mothers to be more 'child-centered' than their fathers [171]. However, these differences were not evaluated with statistical testing. Further research is needed to understand gender differences in parent roles in South African households.

Psychosocial distress among orphans has been documented by a number of studies in sub-Saharan Africa [106, 107, 111, 113, 114, 116, 117, 161-163] and is associated with HIV risk behaviors such as early coital debut among male and female maternal orphans in Zimbabwe [147] and with steep increases in unprotected sex and sexual risk taking among bereaved adolescents after parental death in the United States [123]. Cluver and Gardner conclude that bereavement is a key risk for emotional and behavioral problems among young people orphaned because of AIDS in Cape Town [164] and that the experience of stigma is an important mediator of the relationship between orphanhood and symptoms of psychosocial distress such as depression, post-traumatic stress and conduct problems [117].

Limited evidence suggests that mothers provide more supervision at home than fathers [171], which is not surprising given that young people are more likely to live with their

mothers than with their fathers in South Africa. Both genders in the qualitative study were more likely to associate loss of a mother with lack of guidance at home, though a few males also mentioned the loss of guidance from fathers as important. The lack of supervision at home that young people who have lost a parent reported here was also found among respondents with parental loss in the 2002 household survey in all 9 provinces (see Appendix A). Problematic relationships with older caretakers such as grandmothers, noted in this study, have also been reported in orphan populations in Kenya [169]. The large number of non-orphan youth who live with a grandmother in South Africa may have similar experiences, although their relationships are likely to be moderated in some way by their living but non-resident parent. This study revealed extensive orphan psychosocial distress resulting from living situations. A more balanced picture emerged from a qualitative study of orphan youth in Cape Town, who reported that caregivers may be a source of comfort or distress, depending on the quality of the caregiver relationship [164].

This study indicates that loss of a mother appears to be especially risky for males. In this study, most male maternal orphans aged 15-19 live with a non-parent adult, and they experience increased HIV risk relative to non-orphans living with both parents. In focus group discussions, some males who lost their mothers attributed having more sexual partnerships to the fact that their mothers aren't there to warn them against such behavior. Our study is the first we are aware of to find an association between maternal loss and HIV among males. Other studies have found that maternal loss is particularly risky for females. In South Africa, Operario and colleagues found heightened HIV prevalence among females 15-24 who had lost one or both parents [9]. Female orphans in Zimbabwe are also particularly at risk if they have lost their mothers [126, 132, 134]. While our study found maternal loss associated with risk for females, girls living with their mothers in poverty are also at risk. Loss of a mother surely increases female risk through experience of psychosocial distress and loss of guidance and monitoring, when a mother provided those

things. However, our study shows that living with a mother is also risky. Reasons for this are not understood, beyond the indication that some mothers actively encourage partnerships with older men. It is also possible that female HIV risk may indirectly increase through exposure to a mother's own risk behavior, for those girls who live with their mothers and witness maternal inability to control their own HIV risk and enact healthy behaviors.

In summary, while females who lose either parent have higher HIV risk than those with living parents, HIV risk among males who have lost a parent appears to follow a more complex pattern. Perhaps if males have access to resources, but not to parental guidance, a risky situation results in which males have access to sexual partners but are not kept in check by a caregiver who could encourage more healthy and less risky behaviors. Males who live with both parents may be worse off than males living with only one parent of either gender, because those living with both parents have much higher access to resources, or, maybe males don't have to take on an adult role as quickly if they live with both parents, and therefore are less responsible and practice riskier behaviors. Again, future studies could better investigate these dynamics by assessing the role of socioeconomic status. Maternal death is harmful and may lead to psychological distress and loss of guidance, but for males, the risk associated with maternal loss can apparently be ameliorated by living with a father. Males who have lost their mothers and are living with their fathers experience a decreased risk of HIV infection; males who live with their fathers are rare and may share an atypical bond. Paternal loss is protective unless a male is living with no adult; perhaps in this case, though lower access to resources is protective, living with no adult leads to intense feelings of worthlessness or feeling uncared for, and freedom from supervision, with the result being that risks incurred outweigh the protective effect of lack of resources. Living with no adult is associated with HIV prevalence. The association increases if a male has living parents – in this case, such a male lacks day to day parental guidance, but because both of his parents are living, he may have access to resources which place him at risk, a dangerous

combination.

STRENGTHS

Strengths of the dissertation include use of survey data in high HIV and orphan prevalence communities, the study's assessment of gender, age, and living situation as modifiers of the association between parental loss and HIV, and the added perspective gained by use of qualitative data. The study utilizes survey and qualitative data from South African communities where the prevalence of parental loss and HIV are quite high, while other studies have focused on the entire South African population [9]. It is one of the few studies that take the effects of gender and age into account, something that has been called for in a review of the literature on the orphan crisis [172]. In addition, this study takes the living situation of South African young people into account, by assessing the joint effect of parental loss and parental residence. Most young people in South Africa don't live with both parents, and therefore comparison of young people who have and have not experienced parental loss should take the heterogeneity of living situations among those with living parents into account [173]. Finally, the dissertation has produced the first South African qualitative study on the context of orphan sexual partnerships. It is the second qualitative study that we are aware of to explore the HIV risk behavior of orphans. There is one other, in Tanzania [148].

LIMITATIONS

Survey Data. This study assumes that HIV infections were not acquired through maternal to child transmission. In 2002, at the time of this survey, the South African government did not provide antiretroviral medication. It is highly unlikely that children infected by their mothers would have survived to the age of 15, the youngest age of respondents in our study. Mathematical modeling of the survival of HIV-infected children of

HIV-infected mothers in African settings predicts 13% survival to age 10 years and 0% survival by age 15 years, if HIV is the only cause of mortality [152]. There is therefore a very small possibility that respondents may have been infected by their mothers at birth or through breastfeeding, resulting in a biased elevation in the association between maternal loss and adolescent HIV infection. However, the survey was cross-sectional, making it impossible to know the temporal order of maternal loss and HIV infection.

Young people in this study were born between 1978 and 1987 and therefore very few of their mothers would have been infected with HIV to cause perinatal transmission. In 1990 in South Africa, estimated median HIV prevalence among pregnant women ranged from 0.6% in major urban areas to 0.4% outside major urban areas [153]. However, a small number of young people in this study who experienced maternal loss were infected with HIV and reported never having had sex. These may represent a small number of survivors of perinatally acquired HIV, though we do not know if their mothers were infected with HIV. This small number of survivors of perinatal HIV infection may increase the association between HIV and orphanhood among younger maternally orphaned youth. However, for the great majority of young people in the study, though, HIV is most likely to be acquired through sexual transmission.

All young people, regardless of whether they reported ever having sex, were left in the model because of the high degree of under-reporting of sexual activity. Evidence for under-reporting of sexual activity is most evident among the youngest respondents in the sample – the same population in which we would expect to see perinatal infections. In addition, young people who have experienced parental loss are probably more vulnerable to rape or sexual abuse; in these cases, respondents are likely to under-report sexual activity. All young people were retained in the models presented in this paper because younger age at first sex is thought to be one important pathway through which orphans experience

heightened HIV risk. Restricting analyses to youth who had already become sexually active would therefore underestimate the association between parental loss and HIV prevalence.

Because the survey is cross-sectional, levels of HIV infection among young people born from 1978-1987 who died before 2002 cannot be measured. The exclusion of these infected young people is likely to cause underestimation of the association between parental loss and sexually acquired HIV infection among adolescents and young adults, given the study findings which suggest elevated HIV infection among youth who have lost a parent. The effect of perinatal HIV infection cannot be measured at all by this study, for reasons described above.

In addition, this study indicates that parental loss affects young people differently at different ages, but because it is cross-sectional, we can't assess the effect of the varying stages of the epidemic over time and the fact that older respondents became sexually active at a different phase of the epidemic. For example, respondents who were 24 in 2002 were 15 in 1993, when HIV prevalence among antenatal clinic attendees under the age of 20 was 5 percent. Respondents who were 15 years old in 2002 were becoming sexually active at a much more advanced phase of the epidemic, when HIV prevalence in South Africa among antenatal clinic attendees under the age of 20 was 15 percent, a three-fold increase [4].

A further limitation is that due to the household sampling frame used in the study, young people who live on the streets or in child-headed households were not to be included. Our study therefore under-represents some of the most vulnerable young people in South Africa. If street youth and youth in child-headed households have higher levels of parental loss and HIV than other young people, then our estimate of the association between parental loss and HIV will be biased downwards.

Young people who recently lost a parent may have also been under-represented because of their higher rates of mobility. While mobility is high for all youth in South Africa, recent loss of a mother or father is associated with an almost 75% greater odds of mobility in

the next two years, relative to youth who didn't experience parental death, among young aged 17 and younger in rural Hlabisa [109]. In rural Zimbabwe, mobility also increases after parental death, and is highest among older children [108]. In this study, 15.5 percent of youth who were randomly selected to be interviewed from enumerated households were not found at home after three or more follow-up visits. In addition, the instability brought on by death may mean that households which could not be enumerated in this study were more likely to be homes with parental loss.

In addition, it is possible that the survey under-represents young people who know they are infected with HIV and who may have specifically avoided taking part in the survey to avoid testing and talking about HIV risk behaviors. Fifteen percent of young people who were contacted refused to participate in the survey.

Interpretation of the differences in HIV prevalence among males and females who experience parental loss has suggested hypotheses concerning the psychosocial and socioeconomic effects of parental loss. Poverty in particular has been identified as a possible effect modifier of HIV risk among those who have lost a parent, increasing risk for females but decreasing HIV risk for males. Unfortunately, the survey did not have sufficient measures of socioeconomic status that would allow for the exploration of the role of poverty in HIV risk.

Recent findings from South Africa indicate that the effects of orphanhood on education are context specific and can vary even within the same province. For this reason, the analysis of survey data in this paper which includes all 9 provinces of South Africa may mask important local differences in the relationship between parental loss and HIV risk. Qualitative findings are by nature localized and non-generalizable – though it is interesting to note that both the peri-urban and high-density rural sites in the qualitative study were so similar.

Lastly, this study doesn't examine the effect of identity of non-parent adult guardians such as grandmothers, aunts, siblings, or non-relatives, most of whom are female. Qualitative data indicate that there are likely to be important differences in the HIV risk of young people based on adult caregiver age and identity as well as the quality of relationship with a caregiver and caregiver ability to supervise and provide structure and discipline, nuances which were not taken into consideration in the analysis of survey data.

Limitations of the qualitative study. Participants were fairly well distributed by gender and urban or rural community. At each after school center site, the study was described as a study of orphan partnership and HIV risk behavior, but the study team accepted volunteers regardless of orphan status. Most sessions had between 5 and 7 youth. The largest discussion session had 8 participants. Attendance was particularly low in the younger rural boys group, which had 4 participants in the first session and 5 in the second session. There was a greater level of discrepancy in the level of orphan participation. Only 2 of the 6 older urban females in the study had lost a parent. In most cases, every speaker is identified and matched with his or her orphan status, but in some cases, this was not possible due to difficulty hearing the recording clearly.

The older male and female urban youth were particularly vocal and active focus group participants, and represent a different population from the younger youth attending the urban after school program, because all of the males and 4 out of 6 females were in a peer educator training program. However, the themes which emerged from these groups were quite similar to those from younger urban youth. The most noticeable difference was the fact that the older urban males were more inclined to discuss their own personal experiences than any other group.

There were several possible sources of self-presentation bias in this study. One source of bias may have resulted from youth trying to give responses that they felt the focus group moderators would approve of. Secondly, discussions took place in private, but on the

property of each after school center. Youth may have felt that they could get in trouble for having boyfriends or girlfriends, because these behaviors are actively discouraged by program staff and volunteers. To combat self-presentation bias, and to promote confidentiality, all youth were encouraged to discuss the thoughts and actions of youth presented in scenarios, rather than their own personal experiences. Females rarely discussed their own experiences, and none of them discussed having a boyfriend, although male participants occasionally discussed their own experiences with girlfriends. This may be due to secrecy around adolescent sexual partnerships in South Africa. In rural KwaZulu-Natal, young people engage in two main types of relationships, serious partnerships and more “modern” relationships without a commitment. Serious partnerships tend to be known by families of both partners. Non-committed relationships are considered a normal right of passage for males, but not for females, who must keep these less serious relationships secret from their parents and community members [24].

Limitations of comparing the 2002 survey and 2007 qualitative study. The dissertation draws on qualitative data from one rural and one urban KwaZulu-Natal community in 2007, to provide insight into the association between parental loss and HIV infection found in a 2002 survey from all 9 provinces of South Africa. Even in the same province, the effects of parental loss can be extremely different, as recently exemplified by studies in KwaZulu-Natal of orphanhood and educational status which found a different relationship between educational status and parental roles [174]. It is important to keep in mind that the association between orphanhood and HIV in 2007 KwaZulu-Natal may be quite different from that found in the 2002 survey, and that the qualitative study findings, though they compare rural and urban youth, do not represent orphans in other communities in the same province, or in other areas of South Africa.

IMPLICATIONS FOR POLICY AND PROGRAMS

This dissertation suggests a need to target all young people who are vulnerable because they lack guidance and support from caregivers or because they lack access to resources. Young people who have lost a parent are particularly vulnerable because of their psychosocial distress. Further research should focus on developing prevention strategies to address the specific needs of South African young people at increased risk of HIV because of their living situation, as well as the related and particularly damaging experience of parental loss.

Young people who have lost a parent are not always most at risk economically in South Africa; those who live with young adults or a single adult experience the highest levels of hunger [96]. However, psychosocial risk factors particularly affect youth with parental loss, and interventions need to address these problems which are related to HIV risk behavior among orphans in Zimbabwe [147] and in the United States [123].

Interventions such as cash transfers or creation of employment opportunities for young women [148] would be helpful because they address the important economic component of female HIV risk. These programs should be made available to economically vulnerable young women, regardless of parental loss. Prevention programs also need to address the sorrow and worthlessness felt by orphans of either gender, reported by youth in this study to lead to risk behaviors and sexual partnerships. Lastly, for young people in unhappy living situations where they feel uncared for, and for those in need of effective monitoring and supervision, after school programs for orphans and vulnerable youth provide a partial solution. Such programs lessen the amount of unstructured free time available to youth and at the same time provide positive guidance, activities to build self-esteem, and a sense of community, all of which may ameliorate some of the effects of unhappy living situations. Structural interventions such as earlier and increased access to treatment with

antiretroviral drugs and greater employment opportunities for women are likely to prove most effective in the long run.

Finally, the HIV prevention needs of young people who have lost a parent need to be met without creating or reinforcing stigma. Previous studies have noted that orphans in sub-Saharan Africa experience stigma [125, 138, 178] and qualitative findings from this study reveal stigmatized attitudes towards orphans, particularly in terms of their sexual behavior.

FUTURE DIRECTIONS

Parental loss effects young people's HIV risk through bereavement and changes in living situation that are both social (such as loss of guidance and supervision from parents) and economic. It is possible that bereavement during a key developmental milestone or transition phase could particularly increase risk behavior. How age at parental loss affects risk behavior is an important area for further research and an appropriate focus for future longitudinal study. In addition, bereavement may affect youth differently over the months and years after parental death as youth move from the immediate crisis of loss to long term adaptation to their new circumstances. Papers 1 and 2 measure the association between HIV prevalence and current status of having experienced parental loss. It is quite possible that other aspects of parental loss could impact a young person's risk of HIV infection, such as the duration of time that a young person has been bereaved and the age at which a young person lost his or her parent or parents. The time in a young person's life at which he or she loses a parent may be an important factor affecting his or her psychosocial status, school enrollment, socioeconomic status, and sexual behavior. For example, a child orphaned at the age of 5 years has had very different exposure than a young person orphaned at the age of 16 to parental guidance and influence concerning his or her sexuality. In addition, a young person orphaned at the age of 16 years who is currently 17 years old may be at a different stage of bereavement and may therefore exhibit different

psychosocial and behavioral symptoms than a young person also orphaned at age 16 who is currently 19. These are not part of the planned analysis, but an additional examination of the association between duration of parental loss and HIV prevalence, by age at parental loss, is presented in the Appendix section entitled “Recency of Bereavement and HIV”.

This is the first analyses of this kind that we are aware of using data from sub-Saharan Africa. In the United States, youth who lose a parent infected with HIV experience temporary increases in risk behavior following bereavement [123]. The increased HIV risk in the immediate years following bereavement which our study found among young people under the age of 20 suggests a similar increase in risky behaviors resulting from grief or life changes associated with recent bereavement.

This dissertation has suggested a number of pathways through which youth who have lost a parent experience heightened HIV risk. The Proximate Determinants model of HIV infection guided theorizing about these pathways. The association between parental loss and selected proximate determinants is described in the Appendix to this document. Additional analysis of the proximate determinants by the most frequent combinations of parental loss and living situation would provide important public health insights and will also be completed. In particular, future work should evaluate the gendered pathways of risk experienced by young people who have lost a parent, particularly low socioeconomic status, which may be harmful to females but protective for males.

Finally, analysis for the qualitative paper in this dissertation included focus group discussion comments that were specific to orphan HIV risk behaviors. Many other topics remain to be explored in greater depth through interview and focus group transcripts in this data set, such as the materiality of sexual transactions from the viewpoint of each gender, gender power dynamics, and orphan interactions with male and female caregivers and parents. The qualitative findings presented here reveal extensive distress resulting from orphan living situations, although our study did not attempt to separately assess the effect of

bereavement versus the effect of life changes that orphans experience after parental death. Further studies are needed to understand these pathways.

APPENDIX I:

TABLES

Table 1. Summary of available data on the association between HIV prevalence and parental loss

Authors	Study Population	Study Design	Findings
Operario et al. 2007 [9]	11,904 15-24 year old male and female young people surveyed in South African in 2003	Nationally representative cross-sectional household survey	Adjusting for age and other sociodemographic factors, females who lost any parent had 1.25 times the odds of HIV infection of those with both parents living (95%CI 1.08, 1.44). For males who lost any parent, the odds ratio was 1.16 (0.9, 1.49).
Birdthistle et al. 2008 [132]	863 females aged 15-19 surveyed in Highfield outside of Harare, Zimbabwe in 2004	Cross-sectional survey in random selection of Highfield households	Adjusting for age, females who lost either parent had higher odds of HIV and/or HSV-2 infection related to those with living parents (OR=1.5; 95% CI 1.0, 2.3). Maternal orphans had 2.1 times the odds of HIV and/or HSV-2 infection relative to non-orphans (95%CI 1.1, 4.1). For paternal orphans, the OR of HIV and/or HSV-2 infection was 1.3 (0.7, 2.2).
Gregson et al. 2005 [134]	470 males aged 17-18 and 1,017 females aged 15-18 surveyed in rural Manicaland, Zimbabwe, July 2001 – March 2003	Cross-sectional data from round 2 of a population-based open cohort study	Adjusting for age and socioeconomic status, females who lost a father had 1.15 times the odds of HIV infection of females with living fathers (95%CI 0.44, 3.0), and females whose mother was dead had 3.05 times the odds of HIV infection (95%CI 1.21, 7.22). Parental loss and HIV were not associated among males.
Kang et al. 2008 [126]	196 females aged 16-19 surveyed in peri-urban Zimbabwe	Cross-sectional convenience sample of orphan and non-orphan girls interviewed with ACASI (Audio Computer Assisted Self Interview)	Adjusting for age, girls who lost their mothers had 4.9 times the odds of HIV infection of girls whose mothers were living (95%CI 1.5, 16.0), girls who lost their fathers had an OR of HIV of 1.7 (0.5, 5.5) relative to those with living fathers, and girls who had lost any parent had an OR of HIV infection of 2.7 (0.7, 10.3) relative to those with living parents.
Brookes et al. 2004 [8]	3,988 male and female children aged 2-18 were surveyed and tested for HIV in 2002	Nationally representative cross-sectional household survey	Unadjusted analyses found no statistical difference between the prevalence of HIV among orphan and non-orphan youth ($p=0.644$).
Jewkes et al. 2006 [73, 133]	1,295 Xhosa females [73] and 1,277 Xhosa males [133] aged 15-26 who reported ever having had sex, surveyed between 2002 and 2003 near Mthatha, S. Africa	Baseline for a randomized controlled trial, volunteers recruited mainly from schools in 70 villages	Unadjusted odds ratios of HIV infection calculated using data presented in the paper indicate no statistical difference comparing HIV prevalence of young women who lost any parent with peers and comparing HIV prevalence of young women who lost a mother with those whose mothers are living. Identical analyses with data for young men yield the same results. (The paper does not report ORs, they were calculated from data presented in a table in the paper.)

Table 2. Matrix illustrating classification of parental loss

		Father is Alive?		
		Yes	No	Don't know
Mother is Alive?	Yes	Non-orphan	Paternal loss	
	No	Maternal loss	Double loss	
	Don't know			

Table 3. Focus group discussion study population distribution

Focus Group	Site type	Age group	Gender	Total n participants	Total n meetings
1	Rural	14-15	Male	6	2
3	"	17-18	Male	8	2
2	"	14-15	Female	9	3
4	"	15-17	Female	7	3
5	Urban	14-16	Male	6	2
7	"	16-18	Male	6	2
6	"	14-16	Female	6	3
8	"	15-18	Female	6	3

Table 4. Summary of Partner Ages Used in FGD Partnership Scenarios

Focus Group	Scenario Subject	Scenario 1: Partnership with...	Scenario 2: Partnership with...	Scenario 3: Comparison of partnerships:
Girls 14-16	15 year old girl	15 year old male ³	21 year old male ⁴	Compares 15 year old vs. 21 year old male partner
Girls 17-19	18 year old girl	18 year old male ⁵	25 year old male ⁶	Compares 18 year old vs. 25 year old male partner
Boys 14-16	15 year old boy	12 year old female ⁷	NA	Compares 12 year old ⁵ vs. 15 year old ⁸ female partner
Boys 17-19	18 year old boy	14 year old female ⁹	NA	Compares 14 year old ⁷ vs. 18 year old ¹⁰ female partner

³ Age closest to lower 10th percentile of male partner ages for 15 year old females with current/recent sex partners.

⁴ Age closest to upper 10th percentile of male partner ages for 15 year old females with current/recent sex partners.

⁵ Age closest to lower 10th percentile of male partner ages for 18 year old females with current/recent sex partners.

⁶ Age closest to upper 10th percentile of male partner ages for 18 year old females with current/recent sex partners.

⁷ Age closest to lower 5th percentile of female partner ages for 15 year old males with current/recent sex partners.

⁸ Age closest to upper 5th percentile of female partner ages for 15 year old males with current/recent sex partners.

⁹ Age closest to lower 5th percentile of female partner ages for 18 year old males with current/recent sex partners.

¹⁰ Age closest to upper 5th percentile of female partner ages for 18 year old males with current/recent sex partners.

Table 5. Odds ratios of HIV infection comparing young people who have experienced parental loss with young people whose parents are alive, by gender, adjusting for clustering by community

	Model 1: Males (n=3,856)		Model 2: Females (n=4,796)	
	OR	95% CI	OR	95% CI
Type of parental loss				
Both parents alive (referent)	1.00		1.00	
Loss of father only	1.20	(0.97, 1.50)	1.26	(1.09, 1.46)
Loss of mother only	1.31	(0.77, 2.23)	1.12	(0.78, 1.61)
Loss of both parents	1.72	(0.93, 3.18)	1.58	(1.07, 2.33)

Table 6. Odds ratios of HIV infection relative to females who live with both parents, by age, parental loss, and living situation, estimated by logistic regression with standard errors adjusted for clustering by community, among 4,747 females aged 15-24 in 2002

	15 OR (95%CI)	16 OR (95%CI)	17 OR (95%CI)	18 OR (95%CI)	19 OR (95%CI)	20 OR (95%CI)	21 OR (95%CI)	22 OR (95%CI)	23 OR (95%CI)	24 OR (95%CI)
Parental loss and living situation										
Father dead, live with mother	1.60 (1.00, 2.57)	1.55 (1.03, 2.32)	1.50 (1.06, 2.12)	1.45 (1.07, 1.96)	1.40 (1.06, 1.85)	1.36 (1.03, 1.79)	1.31 (0.97, 1.77)	1.27 (0.90, 1.79)	1.23 (0.82, 1.83)	1.18 (0.75, 1.88)
Father dead, live with no adult	17.39 (5.43, 55.66)	12.07 (4.29, 33.94)	8.38 (3.38, 20.78)	5.81 (2.64, 12.80)	4.04 (2.05, 7.96)	2.80 (1.56, 5.03)	1.94 (1.16, 3.25)	1.35 (0.84, 2.17)	0.94 (0.58, 1.51)	0.65 (0.39, 1.10)
Double loss, live with no adult	4.49 (0.17, 118.94)	3.91 (0.22, 69.87)	3.40 (0.28, 41.16)	2.96 (0.36, 24.34)	2.57 (0.46, 14.50)	2.24 (0.57, 8.74)	1.95 (0.70, 5.41)	1.69 (0.80, 3.57)	1.47 (0.79, 2.74)	1.28 (0.62, 2.67)
Mother dead, live with father	1.48 (0.19, 11.27)	1.29 (0.24, 6.91)	1.12 (0.29, 4.32)	0.97 (0.34, 2.81)	0.84 (0.36, 1.98)	0.73 (0.33, 1.61)	0.64 (0.26, 1.57)	0.55 (0.18, 1.74)	0.48 (0.11, 2.05)	0.42 (0.07, 2.49)
Mother dead, live with no adult	8.39 (0.45, 155.75)	6.15 (0.48, 79.17)	4.51 (0.50, 40.51)	3.31 (0.52, 20.94)	2.43 (0.54, 11.01)	1.78 (0.53, 5.98)	1.31 (0.49, 3.45)	0.96 (0.41, 2.24)	0.70 (0.29, 1.71)	0.52 (0.18, 1.52)
Parents alive, live with no adult	2.38 (1.16, 4.89)	2.21 (1.17, 4.17)	2.05 (1.18, 3.58)	1.91 (1.18, 3.10)	1.77 (1.16, 2.72)	1.65 (1.12, 2.43)	1.53 (1.05, 2.23)	1.43 (0.96, 2.11)	1.33 (0.86, 2.04)	1.23 (0.75, 2.01)
Parents alive, live with mother	1.30 (0.96, 1.77)	1.29 (1.00, 1.66)	1.28 (1.03, 1.59)	1.27 (1.03, 1.56)	1.26 (1.00, 1.58)	1.25 (0.95, 1.64)	1.24 (0.89, 1.72)	1.23 (0.82, 1.82)	1.21 (0.76, 1.94)	1.20 (0.70, 2.07)
Parents alive, live with father	1.34 (0.52, 3.46)	1.34 (0.59, 3.08)	1.35 (0.65, 2.78)	1.35 (0.71, 2.57)	1.36 (0.75, 2.46)	1.36 (0.75, 2.45)	1.36 (0.73, 2.55)	1.37 (0.68, 2.75)	1.37 (0.62, 3.04)	1.37 (0.55, 3.42)
Father dead, live w/non-par. adult	2.05 (1.09, 3.85)	1.86 (1.09, 3.16)	1.68 (1.08, 2.62)	1.52 (1.05, 2.20)	1.38 (1.00, 1.90)	1.25 (0.92, 1.70)	1.13 (0.81, 1.58)	1.02 (0.69, 1.51)	0.93 (0.58, 1.48)	0.84 (0.48, 1.47)
Double loss, live w/non-par. adult	1.21 (0.43, 3.44)	1.24 (0.50, 3.04)	1.27 (0.59, 2.71)	1.30 (0.69, 2.44)	1.33 (0.79, 2.24)	1.36 (0.87, 2.12)	1.39 (0.91, 2.12)	1.42 (0.90, 2.24)	1.46 (0.85, 2.49)	1.49 (0.78, 2.85)
Mother dead, live w/non-par. adult	1.26 (0.34, 4.72)	1.25 (0.42, 3.78)	1.25 (0.51, 3.04)	1.24 (0.62, 2.48)	1.23 (0.73, 2.09)	1.23 (0.80, 1.87)	1.22 (0.79, 1.88)	1.21 (0.70, 2.10)	1.20 (0.58, 2.49)	1.20 (0.47, 3.03)
Parents alive, live w/non-par. adult	1.54 (1.02, 2.34)	1.48 (1.05, 2.07)	1.41 (1.08, 1.85)	1.35 (1.08, 1.69)	1.29 (1.05, 1.60)	1.24 (0.97, 1.58)	1.18 (0.88, 1.60)	1.13 (0.78, 1.65)	1.09 (0.68, 1.72)	1.04 (0.60, 1.80)
Live with both parents (ref)										

Table 7. Odds ratios of HIV infection relative to males who live with both parents, by age, parental loss, and living situation, estimated by logistic regression with standard errors adjusted for clustering by community, among 3,821 males aged 15-24 in 2002

	15 OR (95%CI)	16 OR (95%CI)	17 OR (95%CI)	18 OR (95%CI)	19 OR (95%CI)	20 OR (95%CI)	21 OR (95%CI)	22 OR (95%CI)	23 OR (95%CI)	24 OR (95%CI)
Parental loss and living situation										
Father dead, live with mother	1.62 (0.47, 5.64)	1.33 (0.57, 3.11)	1.09 (0.63, 1.89)	0.90 (0.52, 1.55)	0.74 (0.32, 1.71)	0.68 (0.28, 1.64)	0.71 (0.37, 1.34)	0.73 (0.41, 1.31)	0.76 (0.36, 1.60)	0.79 (0.28, 2.22)
Any parent lost, live with no adult	1.13 (0.04, 29.10)	1.32 (0.10, 16.81)	1.54 (0.23, 10.20)	1.80 (0.46, 7.01)	2.10 (0.67, 6.57)	2.09 (0.74, 5.95)	1.78 (0.82, 3.85)	1.52 (0.78, 2.93)	1.29 (0.59, 2.84)	1.10 (0.38, 3.20)
Mother dead or alive, live with father	0.88 (0.17, 4.62)	0.75 (0.22, 2.58)	0.65 (0.28, 1.50)	0.56 (0.31, 1.01)	0.48 (0.24, 0.94)	0.45 (0.22, 0.92)	0.46 (0.25, 0.84)	0.47 (0.23, 0.93)	0.48 (0.19, 1.20)	0.49 (0.14, 1.66)
Parents alive, live with no adult	3.30 (1.09, 9.94)	2.99 (1.24, 7.23)	2.71 (1.29, 5.70)	2.46 (1.18, 5.11)	2.23 (0.95, 5.24)	1.72 (0.75, 3.93)	1.12 (0.58, 2.17)	0.74 (0.38, 1.43)	0.48 (0.21, 1.12)	0.32 (0.10, 0.96)
Parents alive, live with mother	0.99 (0.41, 2.40)	0.98 (0.51, 1.87)	0.96 (0.59, 1.56)	0.95 (0.60, 1.50)	0.94 (0.52, 1.70)	0.89 (0.49, 1.62)	0.82 (0.51, 1.32)	0.75 (0.45, 1.25)	0.69 (0.35, 1.36)	0.63 (0.25, 1.58)
Father dead, live w/non-parent adult	1.11 (0.21, 5.98)	0.98 (0.30, 3.17)	0.87 (0.39, 1.96)	0.77 (0.34, 1.77)	0.69 (0.21, 2.30)	0.62 (0.17, 2.33)	0.58 (0.19, 1.72)	0.53 (0.20, 1.42)	0.49 (0.18, 1.37)	0.45 (0.14, 1.52)
Double loss, live w/non-parent adult	1.04 (0.20, 5.26)	1.13 (0.32, 4.06)	1.24 (0.42, 3.67)	1.36 (0.44, 4.21)	1.48 (0.37, 6.00)	1.36 (0.34, 5.36)	1.03 (0.35, 3.03)	0.79 (0.28, 2.20)	0.60 (0.17, 2.11)	0.46 (0.09, 2.39)
Mother dead, live w/non-parent adult	5.49 (1.30, 23.15)	3.29 (1.15, 9.38)	1.97 (0.77, 5.01)	1.18 (0.36, 3.82)	0.71 (0.14, 3.59)	0.49 (0.09, 2.66)	0.40 (0.09, 1.72)	0.33 (0.07, 1.52)	0.26 (0.04, 1.74)	0.21 (0.02, 2.33)
Parents alive, live w/non-parent adult	0.68 (0.21, 2.23)	0.64 (0.27, 1.49)	0.60 (0.34, 1.06)	0.56 (0.35, 0.90)	0.53 (0.28, 1.00)	0.55 (0.28, 1.11)	0.65 (0.36, 1.19)	0.77 (0.41, 1.45)	0.90 (0.41, 2.00)	1.06 (0.39, 2.94)
Live with both parents (reference)										

Table 8. Characteristics of 54 focus group study participants aged 14-18 years

	Urban				High density rural				Total
	Female		Male		Female		Male		
	Young	Old	Young	Old	Young	Old	Young	Old	
Orphan Status									
Double	4	1	4	1	1	5	4	4	24
Maternal	0	0	1	1	0	0	0	0	2
Paternal	2	1	1	3	4	0	0	2	13
Non-orphan	0	4	0	1	3	2	1	2	13
Unknown	0	00	0	0	1	0	1	0	2
% Orphaned	100.0%	33.3%	100.0%	83.3%	62.5%	71.4%	80.0%	75.0%	75.0%
Living Situation									
Mother	2	3	1	4	6	2	0	3	21
Grandmother	3	1	3	0	0	0	2	1	10
Aunt	1	0	2	0	1	2	1	1	8
Unrelated	0	0	0	0	0	2	1	2	5
Both parents	0	2	0	0	0	0	0	0	2
Sister	0	0	0	1	0	0	1	0	2
Father	0	0	0	1	0	0	0	0	1
Brother	0	0	0	0	0	1	0	0	1
Unknown	0	0	0	0	2	0	1	1	4
Mean age	14.3	16.0	14.8	17.2	14.3	15.9	14.3	17.8	15.6
Age range	14-16	15-18	14-16	16-18	14-15	15-17	14-15	17-18	14-18
N participants	6	6	6	6	9	7	6	8	54

Table 9. Characteristics of 8 focus discussion groups which met for a total of 20 sessions

	<u>Urban</u>				<u>High density rural</u>				Total
	Female		Male		Female		Male		
	Young	Old	Young	Old	Young	Old	Young	Old	
Mean % orphans per session	100.0%	33.3%	100.0%	90.0%	63.2%	70.0%	66.7%	78.6%	73.0%
Mean age per session	14.4	15.9	14.8	17.2	14.3	15.9	14.2	17.7	15.5
Mean participants per session	5.3	5.0	6.0	5.0	6.3	6.7	4.5	7	5.75
Total meetings	3	3	2	2	3	3	2	2	20
Total attendance, all sessions	16	15	12	10	19	20	9	14	115

Table 10. Associations between contextual (material, emotional, and social) and proximate determinants of HIV infection and parental loss for males, adjusted for age

	Lost father		Lost mother		Lost both		
	Adj. ORs (95% CI)		Adj. ORs (95% CI)		Adj. ORs (95% CI)		n
Material contextual determinants of HIV infection							
Health							
Perceives own health as good to excellent (versus fair or poor)	0.89	(0.71, 1.13)	0.75	(0.49, 1.15)	0.77	(0.46, 1.29)	3882
Visited any clinic in past 12 months	1.11	(0.95, 1.31)	1.65	(1.20, 2.26)	0.98	(0.68, 1.43)	3884
Socioeconomic Status							
Educational status							
In school, below grade for age	1.29	(1.02, 1.62)	1.47	(0.97, 2.25)	2.39	(1.41, 4.04)	3885
Completed HS	1.09	(0.82, 1.45)	0.78	(0.43, 1.41)	0.76	(0.37, 1.54)	
Not enrolled, did not complete H	1.51	(1.20, 1.90)	1.25	(0.79, 1.98)	1.61	(0.93, 2.79)	
In school, average grade for age	1.00		1.00		1.00		
Main activity or vocation							
Unemployed	1.32	(1.05, 1.64)	1.05	(0.68, 1.63)	1.05	(0.63, 1.77)	3845
Employed by self or other	1.29	(0.96, 1.75)	0.9	(0.49, 1.68)	0.83	(0.40, 1.71)	
Full time student	1.00		1.00		1.00		
Main material for dwelling walls							
Traditional materials, mud brick	1.76	(1.37, 2.25)	1.51	(0.93, 2.45)	2.79	(1.65, 4.73)	3881
Temporary shack, plastic, cardboard	0.96	(0.68, 1.36)	1.27	(0.70, 2.31)	2.29	(1.23, 4.28)	
Permanent shack, corrugated iron	1.15	(0.93, 1.43)	0.97	(0.63, 1.51)	1.59	(0.97, 2.61)	
Permanent house – brick or block	1.00		1.00		1.00		
Mother completed secondary school	0.85	(0.72, 1.00)	0.76	(0.54, 1.07)	0.49	(0.32, 0.75)	3676
Father completed secondary school	0.93	(0.78, 1.12)	0.93	(0.67, 1.30)	0.48	(0.30, 0.76)	3418
Knowledge							
Identified condom use as way to avoid HIV	1.01	(0.82, 1.24)	0.87	(0.60, 1.28)	0.92	(0.57, 1.48)	3885
Identified abstinence as way to avoid HIV	0.91	(0.77, 1.07)	0.81	(0.59, 1.12)	1.00	(0.68, 1.46)	3885
Emotional contextual determinants of HIV infection							
Perceives control over life events	0.88	(0.74, 1.06)	0.66	(0.47, 0.92)	0.84	(0.55, 1.28)	3877
Perceives future opportunities as many or limitless	0.77	(0.64, 0.92)	0.7	(0.50, 0.99)	0.69	(0.46, 1.05)	3879

Table 10 (continued). Associations between contextual (material, emotional, and social) and proximate determinants of HIV infection and parental loss for males, adjusted for age

	Lost father		Lost mother		Lost both		
	Adj. ORs (95% CI)		Adj. ORs (95% CI)		Adj. ORs (95% CI)		n
Social contextual determinants of HIV infection							
<i>Relationship Power Dynamics and Attitudes about Sex</i>							
Respondent's partner gets own way in arguments (among those with a current main partner)	1.19	(0.94, 1.49)	1.4	(0.89, 2.21)	1.16	(0.66, 2.02)	2516
Respondent was willing to have sex at first sexual intercourse (among those who have ever had sex)	0.88	(0.52, 1.49)	0.46	(0.21, 1.05)	1.18	(0.28, 4.93)	2581
Ever had sex because of threat or force (among those who have ever had sex)	1.08	(0.66, 1.75)	0.92	(0.33, 2.57)	0.93	(0.28, 3.02)	2582
Believes it is okay to have a sugar mommy or daddy, or a person whom you have sex with so that they will buy you things	0.89	(0.62, 1.26)	1.32	(0.73, 2.39)	0.79	(0.34, 1.84)	3867
Probably or definitely able to avoid sex if he or she doesn't want it	0.99	(0.77, 1.27)	0.79	(0.50, 1.25)	0.77	(0.44, 1.32)	3883
Probably or definitely able to use a condom every time he or she has sex	0.89	(0.71, 1.10)	1.16	(0.74, 1.83)	1.41	(0.80, 2.50)	3878
Probably or definitely able to refuse sex if partner will not use a condom	0.89	(0.73, 1.08)	0.87	(0.60, 1.27)	0.89	(0.57, 1.40)	3880
<i>Home Environment</i>							
Ever spoke to parent or guardian about HIV/AIDS	0.78	(0.66, 0.92)	0.77	(0.55, 1.07)	0.5	(0.32, 0.77)	3868
Respondent has an adult guardian staying with and taking care of	0.82	(0.62, 1.09)	0.62	(0.38, 1.01)	0.32	(0.20, 0.51)	3884
Parent or guardian always knows where respondent is when he or goes out at night (among those with a guardian)	0.82	(0.69, 0.97)	0.92	(0.65, 1.29)	0.74	(0.47, 1.15)	3554
Respondent must be at home by a certain time in the evenings (among those with a guardian)	0.80	(0.67, 0.95)	0.84	(0.59, 1.17)	0.82	(0.53, 1.27)	3546
Proximate determinants of HIV infection							
Youth has a current main partner	1.06	(0.89, 1.27)	0.73	(0.52, 1.02)	0.72	(0.47, 1.09)	3884
Believes main partner has no other partners	0.77	(0.62, 0.96)	0.83	(0.53, 1.29)	0.99	(0.58, 1.71)	2489
Respondent has had vaginal sex	1.11	(0.91, 1.36)	0.88	(0.60, 1.31)	0.79	(0.48, 1.31)	3883

Table 10 (continued). Associations between contextual (material, emotional, and social) and proximate determinants of HIV infection and parental loss for males, adjusted for age

	Lost father		Lost mother		Lost both		
	Adj. ORs (95% CI)		Adj. ORs (95% CI)		Adj. ORs (95% CI)		n
Proximate determinants of HIV infection (continued)							
Ever spoke to first sexual partner about condom use	0.94	(0.78, 1.14)	0.93	(0.63, 1.36)	0.73	(0.47, 1.15)	2581
Used a condom at first sex	1.04	(0.85, 1.26)	0.99	(0.67, 1.47)	0.82	(0.51, 1.33)	2578
Discussed condom use with current or last main partner	0.88	(0.66, 1.17)	1.05	(0.58, 1.92)	0.51	(0.26, 1.00)	1375
Discussed condom use with current or last casual partner	0.87	(0.61, 1.24)	0.7	(0.32, 1.49)	0.84	(0.36, 1.94)	789
Perceived frequency of condom use with current or last main partner							
Always	1.1	(0.77, 1.57)	1.77	(0.85, 3.68)	0.89	(0.39, 2.03)	1108
Inconsistent	0.7	(0.49, 0.99)	0.87	(0.41, 1.86)	0.43	(0.19, 1.01)	
Never	1.00		1.00		1.00		
Perceived frequency of condom use with current/last casual partner							
Always	0.75	(0.50, 1.13)	0.53	(0.23, 1.21)	0.78	(0.31, 1.96)	777
Inconsistent	0.7	(0.44, 1.10)	0.34	(0.11, 0.98)	0.28	(0.07, 1.08)	
Never	1.00		1.00		1.00		
Age-adjusted difference: Mean for each orphan category minus mean for non-orphans							
	Diff.	95% CI	Diff.	95% CI	Diff.	95% CI	n
Age at first sex (among those who ever had sex)	-0.05	(-0.53, 0.44)	-0.39	(-1.36, 0.58)	-0.21	(-1.34, 0.92)	2583
Number of sexual partners in the past 12 months (among those who had any sexual partners in the past 12 months)	0.03	(-0.12, 0.19)	-0.12	(-0.44, 0.20)	-0.03	(-0.42, 0.36)	2138
Lifetime number of sex partners (among those who ever had sex)	0.1	(-0.06, 0.26)	0.5	(0.18, 0.83)	-0.09	(-0.47, 0.29)	2576

Using logistic regression for binary categorical determinants, polytomous logistic regression for categorical determinants with 3 or more categories, and linear regression for continuous categorical determinants

Table 11. Associations between contextual (material, emotional, and social) and proximate determinants of HIV infection and parental loss status for females, adjusted for age

	Lost father		Lost mother		Lost both		
	Adj. ORs (95% CI)		Adj. ORs (95% CI)		Adj. ORs (95% CI)		n
Material contextual determinants of HIV infection							
Health							
Perceives own health as good to excellent (versus fair or poor)	0.85	(0.72, 1.00)	0.90	(0.64, 1.25)	0.72	(0.52, 1.01)	4844
Visited any clinic in past 12 months	1.18	(1.02, 1.38)	1.48	(1.07, 2.04)	1.29	(0.92, 1.81)	4844
Socioeconomic Status							
Educational status							
In school, below grade for age	0.90	(0.69, 1.17)	1.16	(0.70, 1.93)	1.70	(0.96, 3.01)	4844
Completed HS	0.91	(0.72, 1.16)	0.84	(0.52, 1.36)	1.05	(0.59, 1.87)	
Not enrolled, did not complete H	1.22	(1.00, 1.48)	1.28	(0.88, 1.87)	2.85	(1.85, 4.40)	
In school, average grade for age	1.00		1.00		1.00		
Main activity or vocation							
Unemployed	1.14	(0.95, 1.36)	1.16	(0.82, 1.65)	1.80	(1.21, 2.69)	4793
Employed by self or other	1.15	(0.82, 1.60)	1.36	(0.76, 2.44)	2.29	(1.25, 4.19)	
Full time student	1.00		1.00		1.00		
Main material for dwelling walls							
Traditional materials, mud brick	1.39	(1.13, 1.71)	1.32	(0.88, 1.99)	1.60	(1.05, 2.46)	4840
Temporary shack, plastic, cardboard	0.85	(0.59, 1.23)	1.38	(0.77, 2.45)	1.48	(0.79, 2.75)	
Permanent shack, corrugated iron	1.05	(0.86, 1.29)	0.95	(0.64, 1.42)	1.41	(0.96, 2.08)	
Permanent house – brick or block	1.00		1.00		1.00		
Mother completed secondary school	0.73	(0.64, 0.85)	0.97	(0.72, 1.31)	0.76	(0.55, 1.05)	4587
Father completed secondary school	0.76	(0.65, 0.90)	0.78	(0.58, 1.05)	0.93	(0.66, 1.31)	4020
Knowledge							
Identified condom use as way to avoid HIV	1.01	(0.85, 1.20)	1.34	(0.92, 1.96)	1.05	(0.72, 1.54)	4844
Identified abstinence as way to avoid HIV	0.97	(0.85, 1.12)	0.93	(0.71, 1.23)	0.72	(0.53, 0.97)	4844
Emotional contextual determinants of HIV infection							
Perceives control over life events	0.96	(0.83, 1.12)	0.83	(0.63, 1.10)	0.62	(0.46, 0.84)	4835
Perceives future opportunities as many or limitless	0.93	(0.80, 1.07)	0.82	(0.62, 1.08)	0.61	(0.46, 0.82)	4842

Table 11 (continued). Associations between contextual (material, emotional, and social) and proximate determinants of HIV infection and parental loss status for females, adjusted for age

	Lost father		Lost mother		Lost both		n
	Adj. ORs (95% CI)		Adj. ORs (95% CI)		Adj. ORs (95% CI)		
Social contextual determinants of HIV infection							
<i>Relationship Power Dynamics and Attitudes about Sex</i>							
Respondent's partner gets own way in arguments (among those with a current main partner)	1.19	(1.01, 1.40)	1.26	(0.92, 1.73)	1.28	(0.91, 1.80)	3675
Respondent was willing to have sex at first sexual intercourse (among those who have ever had sex)	0.76	(0.65, 0.90)	0.96	(0.70, 1.31)	0.70	(0.51, 0.98)	3452
Ever had sex because of threat or force (among those who have ever had sex)	1.16	(0.92, 1.46)	1.55	(1.04, 2.33)	1.45	(0.93, 2.25)	3459
Believes it is okay to have a sugar mommy or daddy, or a person whom you have sex with so that they will buy you things	0.96	(0.68, 1.37)	1.01	(0.52, 1.96)	3.29	(2.09, 5.17)	4765
Probably or definitely able to avoid sex if he or she doesn't want	0.86	(0.65, 1.13)	1.24	(0.68, 2.25)	0.52	(0.33, 0.82)	4839
Probably or definitely able to use a condom every time he or she has sex	0.82	(0.69, 0.97)	0.91	(0.66, 1.26)	0.79	(0.57, 1.10)	4809
Probably or definitely able to refuse sex if partner will not use a condom	0.87	(0.75, 1.02)	1.07	(0.79, 1.45)	0.94	(0.68, 1.29)	4808
<i>Home Environment</i>							
Ever spoke to parent or guardian about HIV/AIDS	0.99	(0.86, 1.14)	0.56	(0.42, 0.75)	0.43	(0.31, 0.59)	4830
Respondent has an adult guardian staying with and taking care of them	0.76	(0.61, 0.95)	0.60	(0.41, 0.87)	0.52	(0.35, 0.76)	4840
Parent or guardian always knows where respondent is when he goes out at night (among those with a guardian)	1.05	(0.90, 1.23)	1.09	(0.79, 1.49)	0.89	(0.63, 1.25)	4180
Respondent must be at home by a certain time in the evenings (among those with a guardian)	0.77	(0.66, 0.90)	1.05	(0.76, 1.44)	0.76	(0.54, 1.07)	4282

Table 11 (continued). Associations between contextual (material, emotional, and social) and proximate determinants of HIV infection and parental loss status for females, adjusted for age

	Lost father		Lost mother		Lost both		
	Adj. ORs (95% CI)		Adj. ORs (95% CI)		Adj. ORs (95% CI)		n
Proximate determinants of HIV infection							
Youth has a current main partner	1.14	(0.96, 1.36)	0.97	(0.68, 1.37)	0.94	(0.64, 1.37)	4844
Believes main partner has no other partners	0.77	(0.66, 0.90)	0.78	(0.57, 1.06)	1.18	(0.84, 1.67)	3626
Respondent has had vaginal sex	1.35	(1.11, 1.64)	1.22	(0.82, 1.81)	1.16	(0.74, 1.81)	4843
Ever spoke to first sexual partner about condom use	0.87	(0.74, 1.03)	0.84	(0.62, 1.15)	0.58	(0.42, 0.81)	3448
Used a condom at first sex	0.92	(0.78, 1.08)	1.04	(0.76, 1.42)	0.69	(0.48, 0.98)	3443
Discussed condom use with current or last main partner	0.84	(0.68, 1.03)	0.69	(0.48, 0.99)	0.60	(0.40, 0.89)	2738
Discussed condom use with current or last casual partner	0.75	(0.35, 1.60)	0.58	(0.14, 2.42)	0.46	(0.12, 1.68)	209
Perceived frequency of condom use with current or last main partner							
Always	0.77	(0.55 - 1.07)	0.95	(0.55 - 1.66)	1.20	(0.66 - 2.19)	1605
Inconsistent	0.85	(0.66 - 1.10)	0.66	(0.41 - 1.05)	0.73	(0.43 - 1.24)	
Never	1.00		1.00		1.00		
Perceived frequency of condom use with current/last casual partner							
Always	0.38	(0.17 - 0.87)	1.08	(0.24 - 4.84)	0.66	(0.13 - 3.47)	200
Inconsistent	0.72	(0.31 - 1.67)	0.71	(0.11 - 4.58)	1.51	(0.31 - 7.35)	
Never	1.00		1.00		1.00		
Age-adjusted difference: Mean for each orphan category minus mean for non-orphans							
	Diff.	95% CI	Diff.	95% CI	Diff.	95% CI	n
Age at first sex (among those who ever had sex)	0.03	(-0.18, 0.24)	0.11	(-0.29, 0.50)	0.13	(-0.30, 0.56)	3453
Number of sexual partners in the past 12 months (among those who had any sexual partners in the past 12 months)	-0.02	(-0.07, 0.04)	-0.03	(-0.14, 0.07)	0.03	(-0.08, 0.14)	3109
Lifetime number sex partners (among those who had sex)	-0.08	(-0.20, 0.05)	-0.16	(-0.39, 0.07)	-0.39	(-0.64, -0.14)	3455

Using logistic regression for binary categorical determinants, polytomous logistic regression for categorical determinants with 3 or more categories, and linear regression for continuous categorical determinant

Table 12. Odds ratios comparing the odds of HIV infection in young people who recently experienced parental death with those who experienced parental death 3 years previously, by age, gender and type of parental loss

	Odds of HIV infection when father died at young person's present age, versus odds when father died 3 years previously		Odds of HIV infection when mother died at young person's present age, versus odds when mother died 3 years previously	
	OR	95% CI	OR	95% CI
Current age				
	Males (n=885)		Males (n=276)	
15	2.19	(1.59, 3.01)	0.72	(0.27, 1.92)
19	0.92	(0.72, 1.17)	1.61	(1.08, 2.40)
24	0.80	(0.67, 0.96)	0.90	(0.60, 1.35)
	Females (n=1,232)		Females (n=403)	
15	1.17	(0.83, 1.65)	0.93	(0.54, 1.61)
19	0.95	(0.85, 1.06)	1.51	(1.10, 2.09)
24	0.97	(0.86, 1.11)	1.05	(0.86, 1.29)

Note: Calculated from linear combination of estimators from 4 logistic regression models (loss of father and loss of mother, for each gender) adjusted for clustering by community and including interaction terms for age and age of paternal or maternal death

APPENDIX II:

FIGURES

Figure 1. Proximate-determinants conceptual framework for factors affecting sexual transmission of HIV (from Boerma and Weir [1])

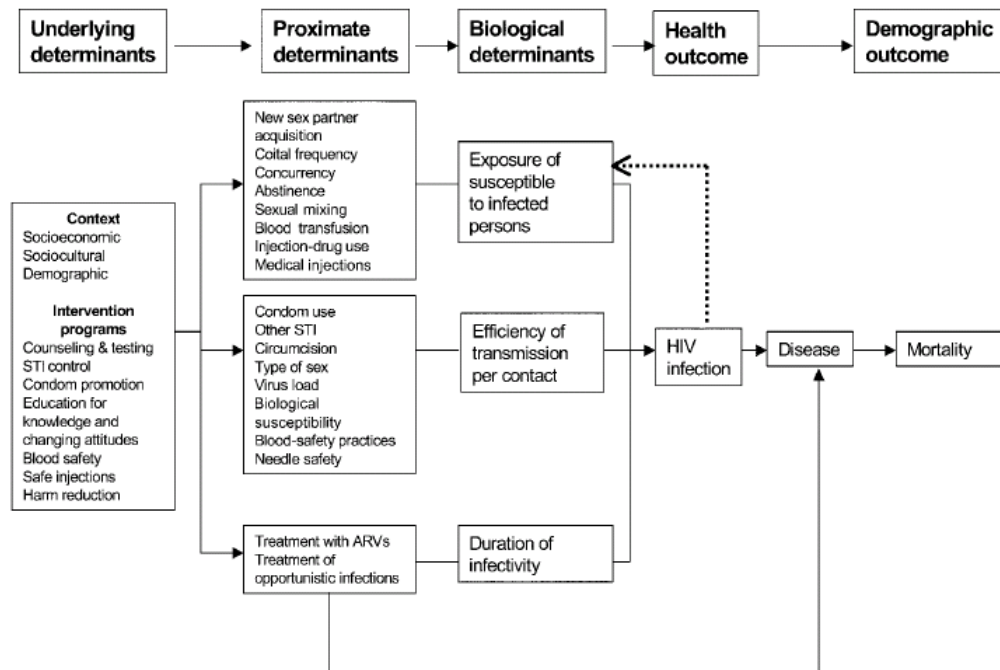


Figure 2. Modified proximate determinant framework illustrating parental loss as an underlying determinant of HIV infection among young people in South Africa

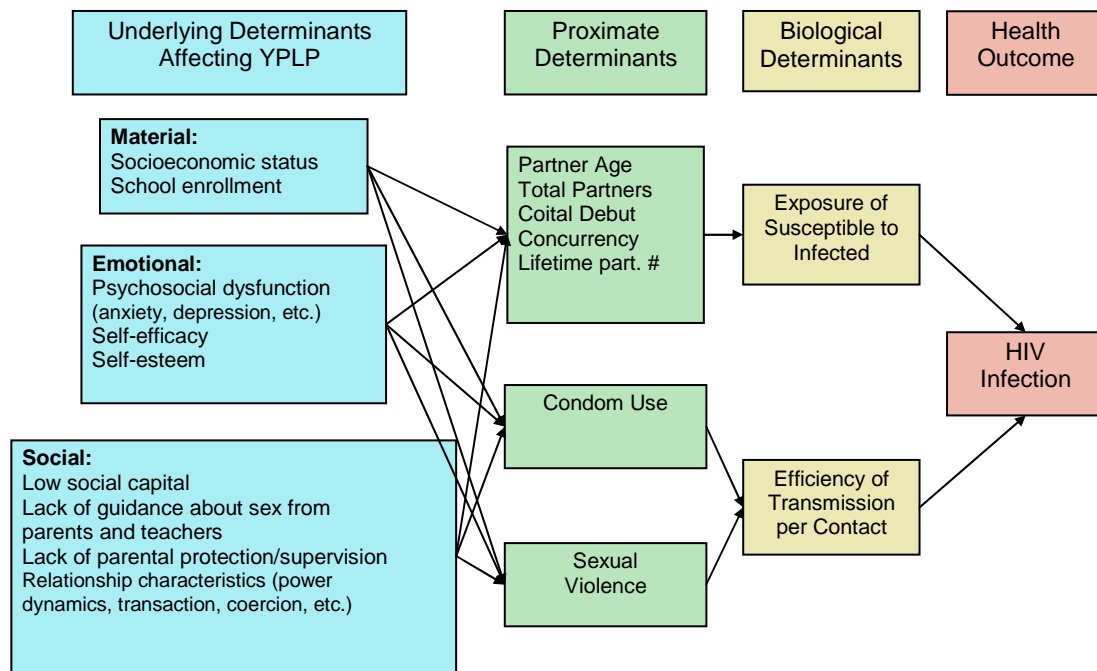


Figure 3. A framework for organizing the relationship between sexual behavior, personal factors and the proximal and distal contexts [139].

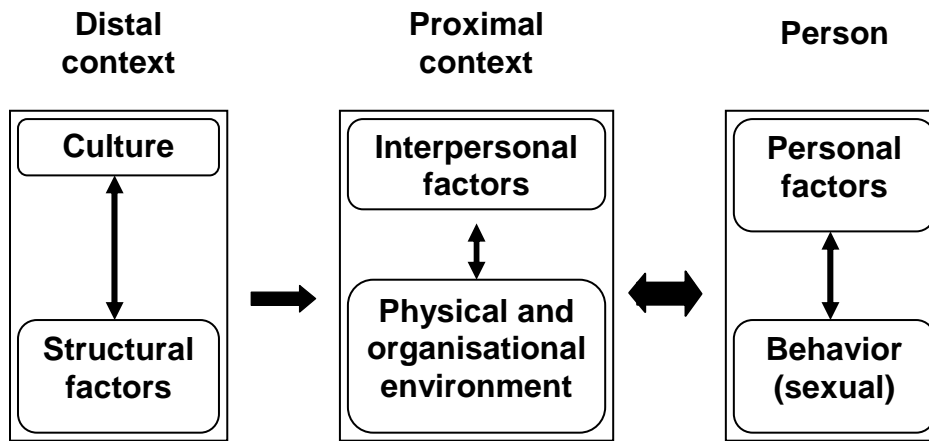


Figure 4. Directed Acyclic Graph of the relationship between experience of parental loss and HIV infection

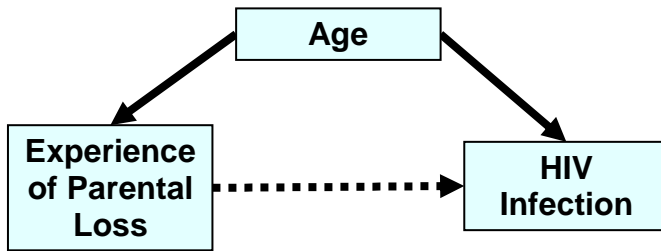


Figure 5. Prevalence of parental loss by age for young women and men in South Africa, 2002

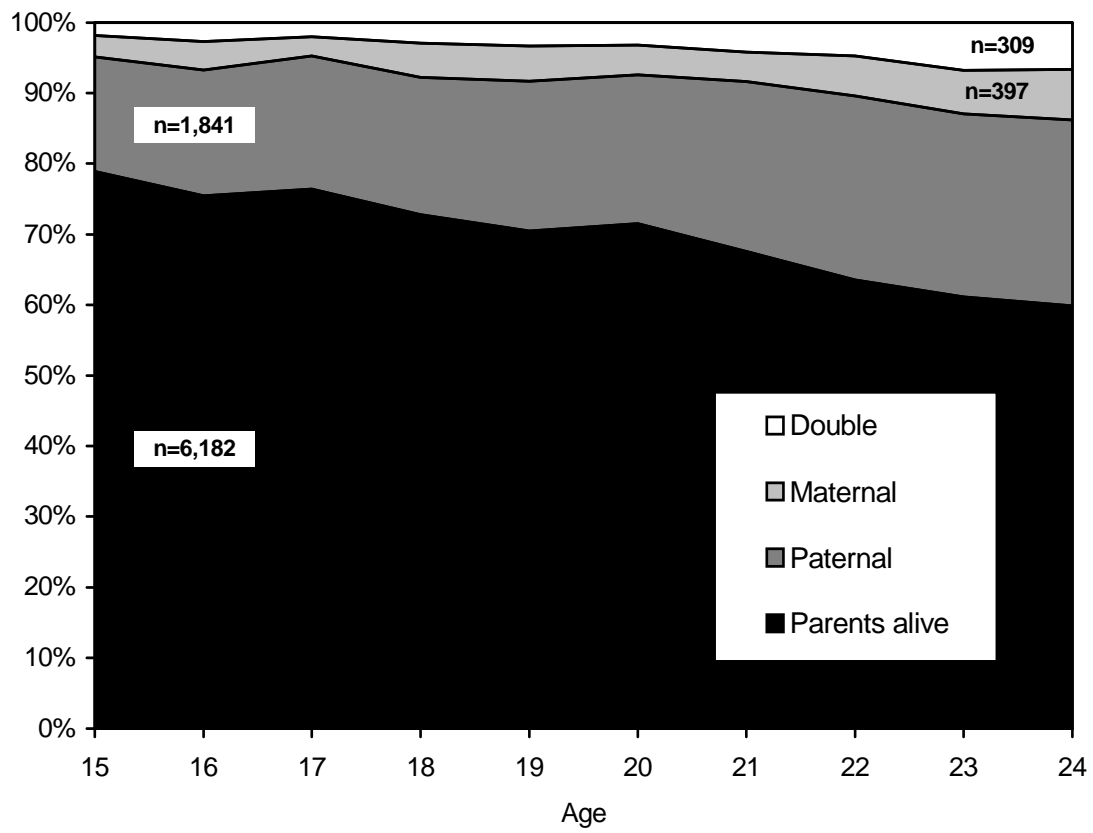


Figure 6. HIV prevalence by age and parental loss among young women and men in South Africa, 2002

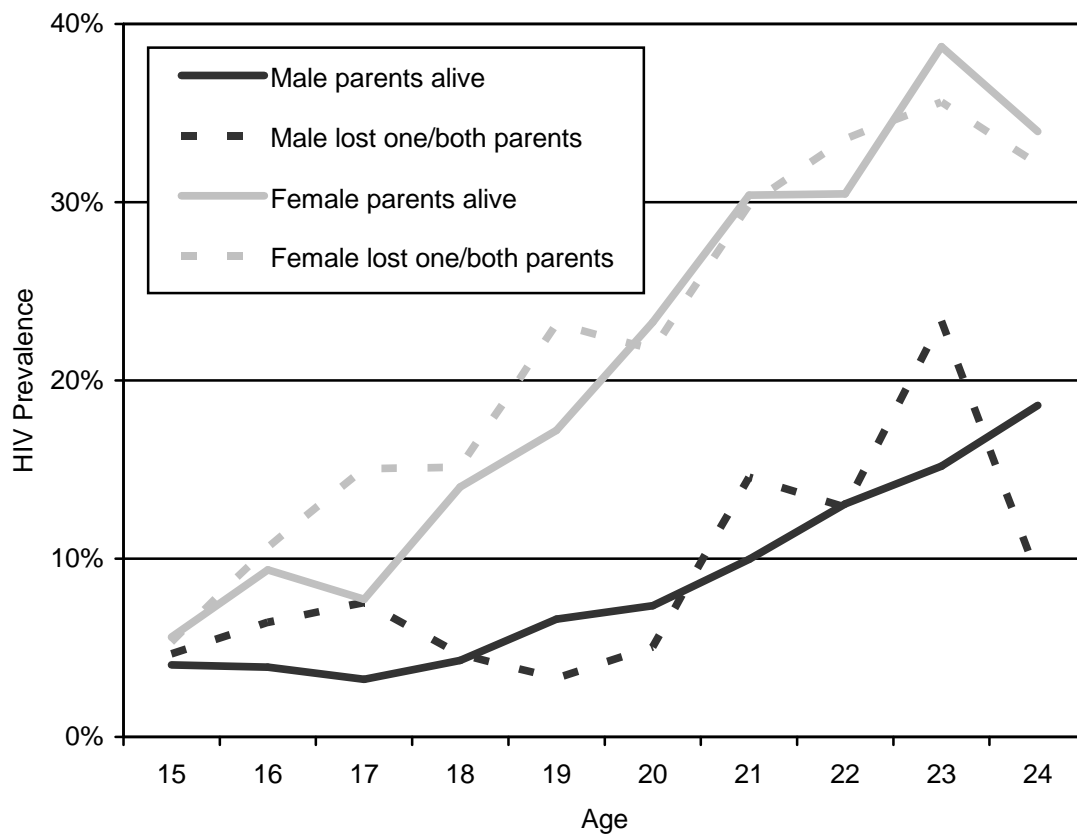
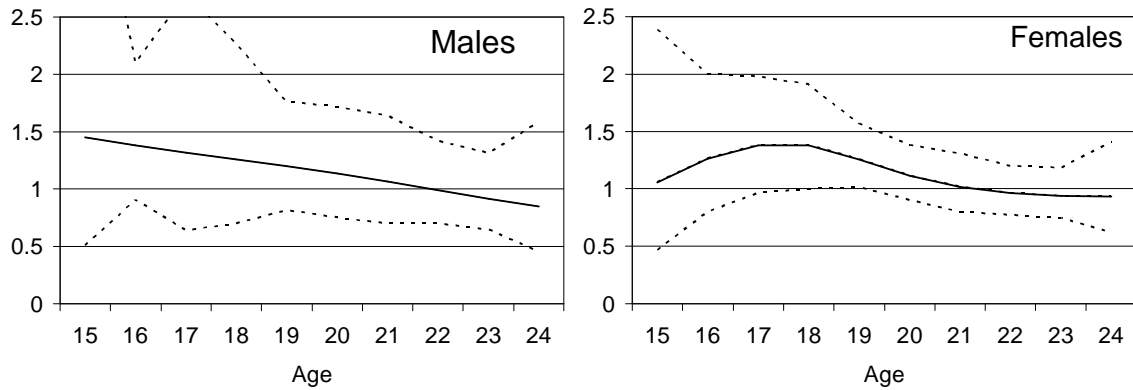
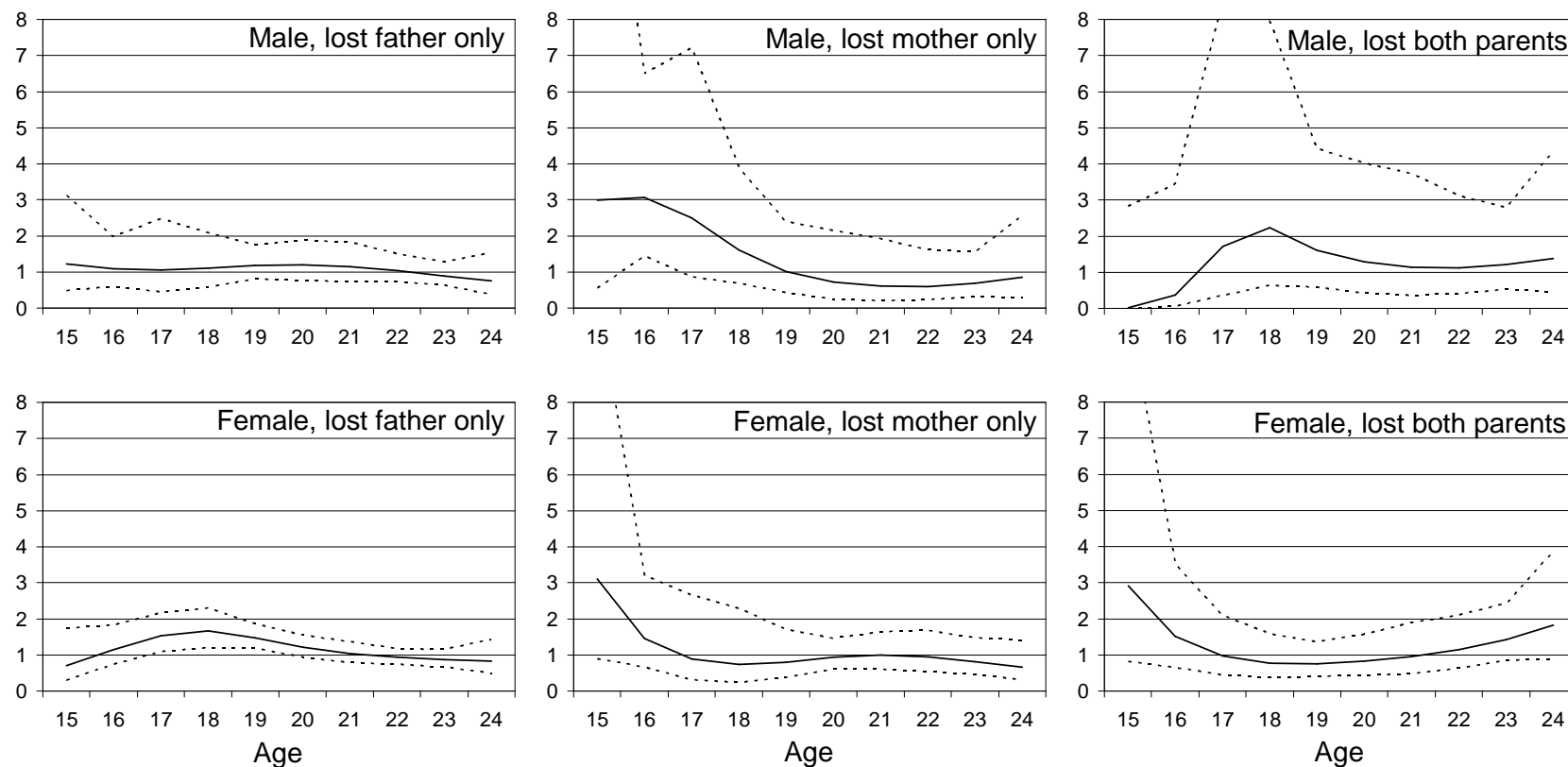


Figure 7. Odds ratios with 95 percent confidence intervals comparing the odds of HIV infection among young people who have experienced parental loss with young people whose parents are living, by age and gender



Note: Odds ratios are estimated by separate male and female logistic regression models, each adjusted for clustering by community. Pseudo-Wald tests did not demonstrate presence of effect measure modification (EMM) by age; $p=0.5049$ in the male model and $p=0.3817$ in the female model, based on *a priori* criteria of $p<0.15$

Figure 8. Odds ratios and 95 percent confidence intervals comparing the odds of HIV infection among young people who lost only a father, only a mother, or both parents with the odds of HIV infection among those with living parents, by age and gender



Note: Odds ratios are estimated by separate male and female logistic regression models, each adjusted for clustering by community. Pseudo-Wald tests demonstrated presence of EMM by age modeled as a quadratic spline; $p=0.1155$ in the male model and $p=0.000$ in the female model based on *a priori* criteria of $p<0.15$

Figure 9. Prevalence of parental loss and residence with parent or other adult guardian, by age and gender

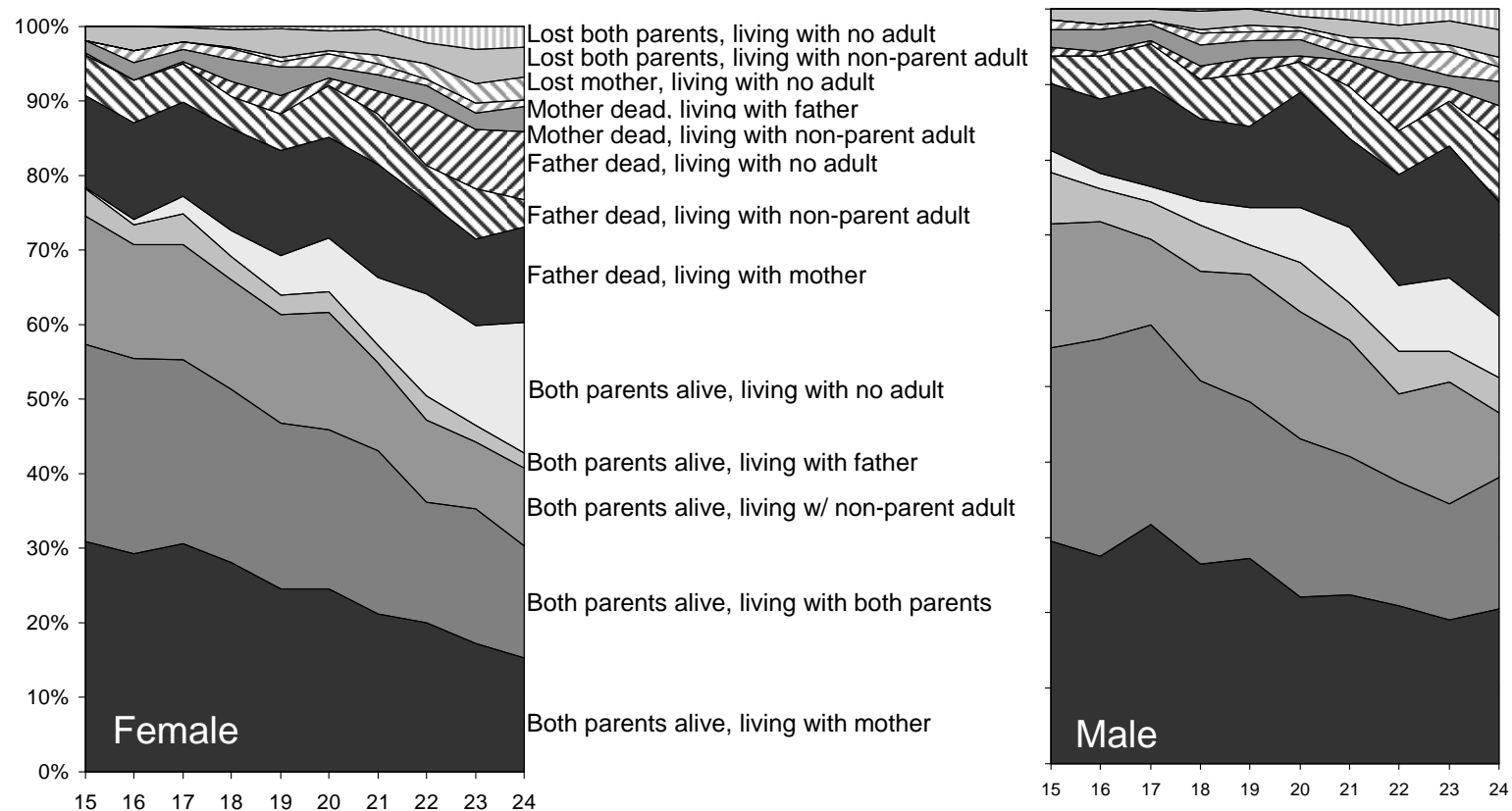
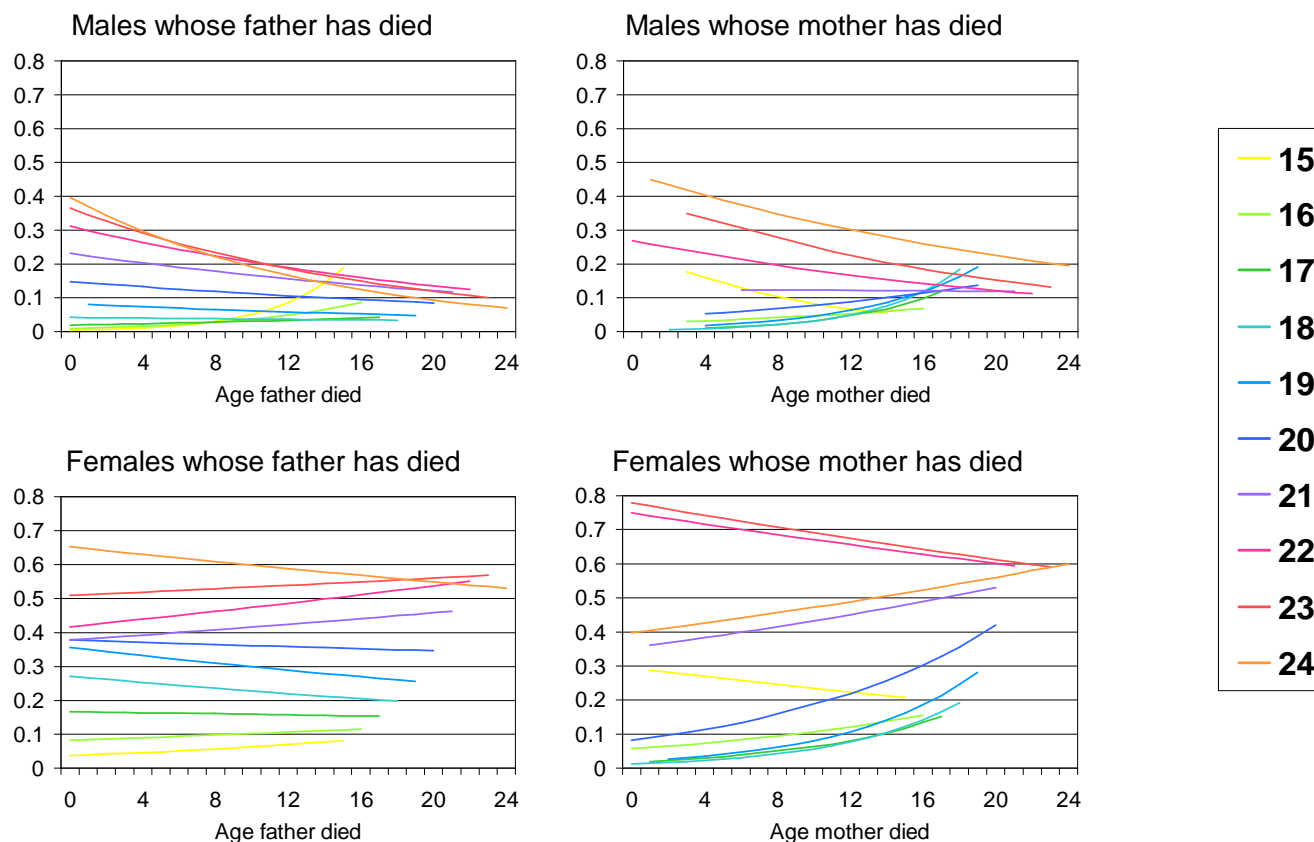


Figure 10. Predicted odds of HIV infection by age of parental death among young people who have lost a parent, by gender and gender of lost parent



Note: Odds ratios are from four logistic regression models (loss of mother and loss of father for males and females), each adjusted for clustering by community. Pseudo-Wald tests demonstrated presence of effect measure modification (EMM) by age for males with dead fathers; $p=0.0000$. EMM by age was not demonstrated for females with dead fathers; $p=0.5450$; based on apriori criteria of $p<0.15$. Pseudo-Wald tests demonstrated presence of EMM by age for both males and females with dead mothers; $p=0.1227$ for males with maternal loss, $p=0.0482$ for females with maternal loss.

APPENDIX III:

ADDITIONAL RESULTS

PROXIMATE DETERMINANTS ANALYSIS

METHODS

This analysis used the 2002 RHRU survey dataset described in detail above. Questions from the survey dataset representing underlying and proximate HIV determinants from the Proximate Determinants Model were assessed as outcomes to evaluate the appropriateness of the Proximate Determinants Model for describing pathways through which orphaned young people experience heightened HIV risk. These outcomes included coital debut, partner age difference, characteristics of partnerships such as power dynamics, violence, and transactional sex, lifetime number of partners, condom use, socioeconomic status, social capital, education, and knowledge about HIV. Bivariate analyses assessed the relationship between parental loss and each of these HIV determinants.

Parental loss and gender were the exposures of interest in this analysis. Youth who experienced maternal, paternal, and double loss were compared with young people who lost neither parent, as described in the Methods section in this document.

As an assessment of the appropriateness of the Proximate Determinants Model for explaining differences in HIV prevalence by parental loss, frequencies of selected underlying determinants of HIV infection that may explain differences in HIV status were examined by parental loss. The relationship between each of these factors and parental loss was measured separately for males and females because of the likelihood that determinants such as low socioeconomic status will affect males and females differently. The socioeconomic status, relationship power dynamics, partner age difference, total number of sexual partners, age at coital debut, having a sex partner who also has other sexual

partners, coital frequency, condom use, and exposure to sexual violence of young people who had and had not lost a parent were compared by gender. Relationships between parental loss and categorical variables were assessed with chi-square tests and relationships between parental loss and continuous variables were assessed with t-tests. Age-adjusted odds ratios were used to assess the association between parental loss and selected Proximate Determinant Model characteristics described above. Odds for youth who experienced maternal, paternal, and double loss were compared with odds for youth with living parents.

RESULTS

Parental Loss and HIV: Contextual Risk Factors. In general, most categories of young people who experienced parental loss, particularly those who had lost both parents, had a higher prevalence of contextual risk factors for HIV infection than those with living parents in terms of their health, socioeconomic status, relationship power dynamics, and home environments (Tables 10 and 11).

Educational status was consistently lower for young people who lost one or both parents. For both genders, young people with any type of parental loss were more likely to have dropped out of school before completing high school than to be in school at the average grade for their age, relative to young people with living parents. Youth with almost any type of parental loss were also more likely to be in school below the average grade for their age and less likely to have completed high school. Those who lost both parents were particularly less likely to have completed high school. Females with double loss had 2.85 times the odds of not completing high school than peers with no loss (95% CI: 1.85 to 4.40) and males with double loss had 1.61 times the odds of peers with no loss (95% CI: 0.93 to 2.79). For both genders, young people with maternal loss were almost always worse off than those with paternal loss in educational status. Youth with any type of parental loss were

less likely to be full-time students, relative to those with living parents. Females were more likely to be employed and males were slightly more likely to be unemployed, relative to those with living parents.

For both genders, young persons with any type of parental loss were less likely to have a mother or father who completed secondary school. Males with double loss fared particularly poorly. They had 0.49 times the odds of having a father who completed secondary school relative to males with living parents (95% CI: 0.30 to 0.76) and 0.48 times the odds of having a mother who completed secondary school (95% CI: 0.32 to 0.75).

Young persons with any type of parental loss were more likely to have a home built from traditional materials rather than a permanent home. Youth with two deceased parents exhibited the strongest contrast with those whose parents were alive. Males with double loss had 2.79 times the odds of living in a traditional home (95% CI: 1.65 to 4.73) and females had 1.6 times the odds (95% CI: 1.05 to 2.46). Males and females with double loss were also especially more likely to live in temporary shacks than those with no loss.

Young persons with any type of parental loss consistently perceived themselves to be in worse health than their peers. All three categories of young people with parental loss among both genders were less likely to perceive their own health as good to excellent, relative to young people with living parents. Most youth with any type of parental loss were more likely to have visited a clinic in the past 12 months. Females with maternal loss had 1.48 times the odds of visiting a clinic than those whose parents were living (95% CI: 1.07 to 2.04) and males with maternal loss had 1.65 times the odds of those whose parents were living (95% CI: 1.20 to 2.26).

Knowledge of ways to avoid HIV was inconsistent among youth who had experienced parental loss. In general, most youth with parental loss were less likely to identify abstinence as a way to avoid HIV than those with living parents. Females with double loss were particularly less likely to identify abstinence, with an odds ratio of 0.72

(95% CI: 0.53 to 0.97). Males with a dead parent were generally less likely than their peers to identify condom use as a method of HIV prevention, while females with parental loss were generally more likely than their peers to identify condoms.

Perceived control over life events was lower in for youth in every category of parental loss. Females with double loss had the lowest odds ratio of perceived control, 0.62 (95% CI: 0.46 to 0.84). Perceived future opportunities were also relatively low for every parental loss category. Youth of each gender with two deceased parents were least likely to perceive future opportunities.

Home environment characteristics were relatively worse for most youth who lost a parent among both genders. Young persons with any type of parental loss were less likely to have spoken to a parent or guardian about HIV and less likely to live with an adult guardian; young people with two deceased parents suffered most in these areas. Every male who had lost a parent had less adult supervision, while for females, only those with double and paternal loss had less supervision than those with living parents. Girls without a father had 0.77 times the odds of having a curfew relative to those with living parents (96% CI: 0.66 to 0.90) and girls who had lost both parents had an odds ratio of 0.76 (95% CI: 0.54 to 1.07).

Relationship and sexual power dynamics were unfavorable for youth of both genders with most types of parental loss. Among females, those with double loss exhibited the strongest contrast with those whose parents were alive. Their partners were more likely to get their own way in an argument (OR 1.28, 95% CI: 0.91 to 1.80), they were less willing to have had sex at their first sexual intercourse (OR 0.70, 95% CI: 0.51 to 0.98), they were more likely to approve of sugar mommy or daddy relationships (OR 3.29, 95% CI: 2.09 to 5.17), they were less likely to be able to use a condom every time they had sex (OR 0.79, 95% CI: 0.57 to 1.10), and they were less likely to be able to refuse sex if their partner would not use a condom (OR 0.94, 95% CI: 0.68 to 1.29). Males with parental loss also exhibited

lower power in relationships, with few exceptions. Surprisingly, males with maternal and double loss were more likely to be able to use a condom every time they had sex than those with living parents.

Parental Loss and HIV: Proximate Determinants. Youth who had experienced the loss of a parent exhibited risky sexual behaviors relative to their peers. Most young people of either gender parental loss, who had a main partner, were less likely to believe their partner had no other partners and less likely to discuss condom use with current or last main and casual partners. Youth with double loss were at particular disadvantage in terms of their condom use. They were least likely of all young people who lost a parent to use condoms at first sex, relative to those with living parents (males, OR 0.82, 95% CI: 0.51 to 1.33 and females, OR 0.69, 95% CI: 0.48 to 0.98). Both males and females with double loss were least likely to speak about condoms with their first sex partner relative to those with living parents (males, OR 0.73, 95% CI: 0.47 to 1.15, females 0.58, 95% CI: 0.42 to 0.81) and least likely to discuss condoms with their current or last main partner. Males with double loss were also least likely to report any condom use with current or last main or casual partners.

For other proximate determinants, the relationship between parental loss and HIV risk was ambivalent. Males with maternal and double loss were less likely than those with living parents to have ever had sex or to have a current main partner. Those males with maternal and double loss who had sex in the past 12 months had fewer partners on average than those whose parents were alive. However, males who had experienced any type of parental loss and who had ever had sex had a lower mean age at first sex than those with living parents. The mean age at first sex among males with dead mothers was 0.39 years younger than that of males with living parents (95% CI: -1.36 to 0.58).

While females with double loss were usually the most disadvantaged of all young people who lost a parent in terms of psychosocial contextual factors, this pattern did not

hold for proximate determinants. Of the three female parental loss categories, girls who had lost only their father were worst off in terms of many proximate determinants of HIV. They were most likely to have ever had sex (OR 1.35 relative to those with living parents, 95% CI: 1.11 to 1.64), most likely to have a current main partner, least likely to believe their main partner had no other partners (OR 0.77 relative to those with living parents, 95% CI: 0.66 to 0.90), and least likely to always use a condom with current or last main partner. Surprisingly, females with double loss had 0.39 fewer lifetime partners than those whose parents were living (95% CI: -0.64 to -0.14).

DISCUSSION

Contextual determinant findings. Contextual risk factors for HIV were generally elevated among young people of both genders who had lost one or both parents. Nationwide in South Africa, mothers and teachers are thought to be some of the most important sources of information about sex and sexual abuse for children aged 12 to 14 [8] and orphans in South Africa are less likely to be in school than their peers. This implies that orphans who are not in school or who have lost their mothers are unlikely to receive this important guidance and information. In this study, young people with maternal and double loss were most likely to be behind in school and least likely to have spoken to a parent or guardian about HIV/AIDS. Girls who had lost their mother had 0.56 times the odds of those with living parents of having spoken to a parent or guardian about HIV/AIDS (95% CI: 0.42 to 0.75), while females with double loss had 0.43 times the odds of those whose parents were alive (95% CI: 0.31 to 0.59). Although maternally bereaved youth in this study had less communication about HIV at home and lower educational attainment, their knowledge about how to avoid HIV was similar to that of non-bereaved young people.

In this study, young people of both genders who had lost one or both parents were less likely to have an adult guardian staying with them at home, and those with a guardian

were less likely than young people with living parents to have an evening curfew. Lack of supervision at home was identified as an important factor facilitating orphan sexual partnerships in a qualitative study in KwaZulu-Natal [147]. The lack of adult supervision experienced by young people who lost a parent could also make them more vulnerable to sexual abuse. To date, there has been no documentation of increased sexual abuse of adolescents who are orphaned, although orphans have more “unwilling” first sexual experiences in South Africa [51]. In this study, all types of females with parental loss were more likely to have experienced unwanted sex. Females who lost both parents were much less likely than those with living parents to have been willing to have sex at first intercourse (OR 0.70, 95% CI: 0.51 to 0.98) and less able to avoid sex if they didn't want it (OR 0.52, 95% CI: 0.33 to 0.82). All females with parental loss were also more likely than their peers to have ever been forced or threatened to have sex (OR for females with maternal loss relative to those with living parents of 1.55, 96% CI: 1.04 to 2.33).

Proximate determinant findings. Our study adds to mounting evidence that young people who have experienced parental loss are more likely to have risky sexual behaviors. In this study, both males and females with parental loss were less likely to discuss or use condoms than their peers. Similar results have been found in previous South African surveys. The national survey found males with parental loss less likely to have used condoms the last time they had sex [9], and another survey found both that males and females who had lost a parent were less likely to discuss condom use with their recent sex partners [31].

Previous studies suggest that young people of both genders who have lost a parent and youth who do not live with a parent in South Africa are more likely to have had sex than their peers [11, 16, 17] and to have an earlier age at coital debut [51]. Risk behaviors in our study were found to differ by both gender and type of parental loss. Although many of these estimates are imprecise, they point to the possibility of gender-specific pathways of risk that

should be further explored. Females with parental loss were more likely to have ever had sex, but among those who had, their age at first sex was slightly higher than age at first sex of those with living parents and they had a lower number of lifetime sex partners. Similar results were found in Zimbabwe, where maternally orphaned young women were more likely to have had sex than their peers [28]. In contrast, our study found that males with parental loss were less likely to have had sex than their peers, but those males with parental loss who had ever had sex had a younger age at first sex.

The proximate determinants model highlights differences between young people who have and have not experienced parental loss in both contextual and proximate determinants of HIV. However, rather than illuminating one clear pattern of heightened risk associated with parental loss, there appear to be a large number of factors that are associated with small increases in risk. A variety of risk patterns may explain higher HIV prevalence among young people with parental loss, based on many factors such as gender, the gender of parental loss, home environment, and community and cultural differences.

RECENCY OF BEREAVEMENT AND HIV

METHODS

Logistic regression analysis was used to measure the association between HIV and recency and age of maternal or paternal loss among youth who had lost any parent. Interaction terms for age and recency of parental death were included because of an apriori assumption that parental loss would have different repercussions for young people of different ages. Age was modeled as a restricted quadratic spline because of the nonlinear relationship between age and HIV infection. Confounding by exposure to loveLife or NAFCI programs was tested for in each multivariable model, but determined to be unnecessary in each case because it did not result in a change in the effect estimate of the association

between parental loss and HIV infection. Important determinants of HIV risk such as socioeconomic status and educational attainment were not included in the models because they are on the causal pathway between parental loss and HIV infection. Separate male and female models were constructed for each analysis because of the very different pattern of HIV infection experienced by males and females. Models were assessed for goodness of fit using the appropriate form of Hosmer and Lemeshow's test [146].

RESULTS

There were distinct age and gender specific patterns in the association between recency of parental death and HIV infection (Figure 10). Among males 15-17 who had lost their fathers, odds of HIV infection were highest when paternal death was recent. Among older males who had lost their fathers, the odds of HIV infection were *lowest* among those recently bereaved. For example, a 15 year old male who lost his father at age 15 had 2.19 times the odds of HIV infection of a 15 year old male who had lost his father at age 12 (95% CI: 1.59 to 3.01) (Table 12). In contrast, a 24 year old male who lost his father at age 24 had 0.80 times the odds of HIV infection of a 24 year old who lost his father at age 21 (95% CI: 0.67, 0.96). This trend is not apparent for females who lost their fathers.

Among males aged 16 to 20 who lost their mothers, odds of HIV infection were highest among those for whom maternal death was recent. For example, a 19 year old male who lost his mother at age 19 had 1.61 times the odds of HIV infection of a 19 year old who lost his mother at age 16 (95% CI: 1.08 to 2.40). Among older males who had lost their mothers, the odds of HIV infection were *lowest* among those recently bereaved. For most females who lost their mothers, the odds of infection were greatest among those for whom maternal death was recent. For example, a 19 year old female who lost her mother at age 19 had 1.51 times the odds of HIV infection of a 19 year old who lost her mother at age 16 (95% CI: 1.10 to 2.09).

DISCUSSION

Recent loss of a father or a mother was associated with elevated HIV prevalence among younger males. Among older males with paternal and maternal loss, odds of HIV infection were highest among those bereaved for the longest time and lower among those who lost their parent recently. For females who had lost a mother, at almost every age, the odds of HIV infection were highest among those most recently bereaved. For females with dead fathers, the odds of HIV infection did not differ by recency of bereavement. In the United States, parental loss is associated with immediate increases in unprotected sex among adolescents. Levels of sexual risk taking remain higher relative to non-bereaved peers over one year later [123]. Parental loss may affect young people differently over stages in the transition to adulthood. For example, parental loss during a key developmental milestone or transition phase could increase risk behavior. Unfortunately it was not possible to explore this effect in the present cross-sectional dataset.

Our study suggests that there are two important components of HIV risk: bereavement and non-residence with a parent. The heightened HIV risk experienced by all younger adolescents who recently lost their mothers and younger males who recently lost their fathers may indicate heightened HIV risk behaviors associated with psychosocial distress caused by recent parental illness and death.

APPENDIX IV:
INFORMED CONSENT

**PARENT OR CARE GIVER CONSENT FOR A MINOR AGED 14-17 TO
PARTICIPATE IN A RESEARCH STUDY: FGD**

University of North Carolina-Chapel Hill
Parent or Caregiver Consent for a Minor aged 14-17 to Participate in a Research Study
Social Behavioral Form

IRB Study #: 06-0306
Consent Form Version Date: January 4, 2006

Title of Study: Orphanhood and HIV Infection Among Adolescents in South Africa

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Faculty Advisor: Dr. William C. Miller

Funding Source: University Center for International Studies Dissertation Research Travel Award

Study Contact information is provided at back of this document.

Note: This sheet will be read aloud in Zulu by a familiar and trusted community member affiliated with the local Ark and a copy of this document will be presented in Zulu to each adult as a Participant Information Sheet

Hello. For those of you who don't know me, my name is _____. I am (describe role at (NAME OF ORPHAN ORGANIZATION) Ark and in community). I would like to talk to you about a research study that your child (or the child in your care) has been invited to participate in.

What are some general things you should know about research studies?

You are being asked to allow your child or a child under your care to take part in a research study. To join the study is completely voluntary. You may refuse to give permission, or you may withdraw your permission for your child (or the child under your care) to be in the study, for any reason, at any time. Even if you give your permission, your child (or the child under your care) can decide not to be in the study or to leave the study at any time and for any reason. Your child can also refuse to answer any question during a discussion at any time, for any reason. It is important for you to know that participation in this study will not affect the services that you, your child (or the child in your care) receive from (name of Ark) in any way. In other words, you will not receive additional services, nor will you have services or benefits taken away from either being in or not being a part of this study. If

your child (or the child under your care) does join this study, he or she can drop out of the study at any time and it will not affect services you receive in any way.

Research studies are designed to obtain new knowledge. This new information may help people in the future. Your child (or the child under your care) may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

You will be given a study information sheet that contains all the information I am presenting to you here. Contact names and information are provided at the end of this document so that you, your child (or the child in your care) can ask questions about this study at any time.

What is the purpose of this study?

This study is part of Elizabeth Jackson's PhD research. Elizabeth is a student at the University of North Carolina in the United States who has worked here in KwaZulu-Natal in the past. Her PhD research focuses on HIV prevention for orphaned adolescents in South Africa. Many young people here enter into sexual relationships that can put them at risk of being infected with HIV. Your child (or the child under your care) is being invited to take part in this study to help develop a peer support group program to protect young people like him or her from HIV. The fact that we are asking to speak to your child does not mean your child has had sex. We are interested in speaking with young people about their thoughts and feelings on relationships in general and we are interested in speaking to young people regardless of whether or not they have ever had sex. We would like to understand the way that different types of partnerships fit into their lives from their point of view. We will use this information to create HIV prevention programs for orphaned young people in this community and in South Africa. This study is meant to develop an HIV prevention peer support group at this Ark that your child (or the child under your care) can take part in.

Your child (or the child under your care) is invited to be in the study because he or she is an adolescent between the ages of 14 and 17 in South Africa who has lost one or both parents.

Are there any reasons your child (or the child under your care) should not be in this study?

If your child (or the child under your care) is uncomfortable talking in a group about relationships and sexual partnerships involving young people in this community, then your child (or the child under your care) should probably not take part in this group discussion study.

How many people will take part in this study?

If your child (or the child under your care) is in this study, he or she will be one of approximately 28 people in this research study in this community. In one other community, 28 other young people will also participate, making a total of 56 young people.

How long will the part of your child (or the child under your care) last in this study?

Young people will take part in 1 to 3 group discussions over a period of about 3 weeks. Your child (or the child under your care) can withdraw from the study at any time. If your child (or the child under your care) would like to be interviewed one-on-one, he or she will be able to volunteer to do so after the final focus group discussion.

What will happen if your child (or the child under your care) takes part in the study?

- If your child (or the child under your care) takes part in this study, he or she will meet with a group of around 6 other young people up to three times for a discussion moderated by (name of male moderator) or (name of female moderator). Discussions will last about 1 hour each.
- At the beginning of each discussion, your child (or the child under your care) will be given an informational sheet that provides information on resources and numbers to call for counseling if he or she experiences emotional distress resulting from a discussion or if he or she would like more help talking through the things discussed by the group.
- Your child (or the child in your care) will be asked for permission to have discussions recorded.

- In the first session, your child (or the child under your care) will be asked to talk about the situation of a young person in a story who is close to his or her age who has a boyfriend or girlfriend of the opposite sex. Young people will be asked to discuss the young person in the story including talking about how the young person started his or her relationship, the characteristics of his or her relationship, and how the young person in the story can avoid HIV risk in his or her relationship. Young people will be asked to talk about if and how being an orphan could affect relationship characteristics and HIV risk behaviours.
- In the second session, girls will be asked to discuss a story about a young girl their age who has a much older sex partner. The same questions will be asked about this relationship as those asked in the first session.
- In the last session (the 3rd session for girls and the 2nd session for boys), young people will be asked to discuss a story about a person their age who is choosing between relationship partners of different ages. Young people will also be asked to discuss peer support group formation and to help design a peer support group intervention to help orphaned young people avoid HIV.
- After the last session, if your child (or the child under your care) would like to be interviewed one-on-one, he or she will be able to volunteer to do so. If he or she volunteers for the interview study, an informed consent process similar to this session will take place in order to seek your permission for your child (or the child under your care) to participate. If many children volunteer for interviews, time may not permit interviews to take place with each child.

What are the possible benefits from being in this study?

Research is designed to benefit society by gaining new knowledge. Your child (or the child under your care) may not benefit personally from being in this research study. However, if he or she is interested in being in a peer support group, this study will give him or her an opportunity to participate in the first peer support groups run by (NAME OF ORPHAN ORGANIZATION). Groups who are interested can continue to meet as peer support groups with support from (NAME OF ORPHAN ORGANIZATION).

What are the possible risks or discomforts involved from being in this study?

If your child (or the child under your care) takes part in this study, he or she may feel uncomfortable or embarrassed to talk about some of the topics that will be discussed. This experience could cause psychosocial distress. You should report any problems to the researcher using the contact information listed at the back of this document.

Your child (or the child under your care) will *not* be asked if he or she has ever been raped or experienced any other kind of child abuse in this study. That is because if he or she tells the study team about a rape or other abuse (including neglect, physical abuse, sexual abuse, or child prostitution), the study team is obligated by law to report the abuse to the nearest Family Violence, Child Protection and Sexual Offences unit of the South African Police Service. Therefore, in order to protect the privacy of the child, we will not ask about rape or abuse. We will ask the child not to tell us that about any abuse unless he or she would like it to be reported, and we will provide contact information for free counselling and information services to assist any young people who may have experienced abuse that they can contact on their own, without letting us know about any abuse.

Another possible risk your child (or the child in your care) could face from this study is the chance that he or she could divulge self-incriminating information about illegal behaviour to the study team. All information will be kept confidential and identifying information will be destroyed, but there is always the chance that another focus group participant could break his or her oath of confidentiality and divulge this information, or that a member of the study team could be called to testify about a crime that he or she remembers hearing about, even if no written record remains. For this reason, we urge young people not to divulge any self-incriminating information in focus group discussions. In fact, focus group discussions will be general and young people will be urged not to share personal or sensitive information of any kind during discussions.

Confidentiality cannot be guaranteed in group discussions. Young people participating in the groups will give a verbal pledge of confidentiality not to share any information from discussions with persons outside the group, except for family members, caregivers, or counsellors. However, there is still a risk that your child (or the child in your care) could reveal personal or sensitive information in a group discussion and that this information could be divulged, leading to harm. At all times, group discussions will be general and young people will be asked not to discuss personal details or stories.

How will the privacy of your child (or the child under your care) be protected?

The child's name will not be identified on recordings or written in transcripts. Recordings and transcripts will be identified and linked by a code that only the head of the study will know means it links to each child. A master list linking the child's name to his or her code will be kept in a safe and locked place until we have completed our last discussion. Then, it will be destroyed and it will no longer be possible to link the code on the documents and recordings with any child's name. Your child (or the child under your care) will not be identified in any report or publication about this study. All discussions will take place in a room where other people cannot overhear what is being said. The study team will not tell anyone the name of your child (or the child under your care), or any information that could be used to identify him or her. Recordings will only be accessed by the study team and recordings and written transcripts will be stored in a safe and locked place. At the end of the study, recordings will be destroyed. In addition, we will not be able to tell you about what your child (or the child under your care) or any other study participants say during a discussion.

What if your child (or the child under your care) wants to leave a discussion before it is completed or before the second or third session?

If your child (or the child under your care) feels uncomfortable at any time during the interview, he or she can simply not answer a question or can leave the room at any time. There is no penalty for ending his or her participation at any time; we do not want young people to experience any distress and would rather that a young person leave the study rather than experience any emotional distress.

What if you want to withdraw your child (or the child under your care) from this study?

You may withdraw your child (or the child under your care) from this study at any time, for any reason, regardless of the child's wishes.

Will your child (or the child under your care) receive anything for being in this study?

At the start of each discussion, your child (or the child under your care) will receive a beverage to drink and a meal will be provided after the discussion. He or she will also receive round trip taxi fare for transport to and from the discussion, if necessary. If he or she decides to end his or her participation in the discussion before it is over, he or she will still receive the meal and beverage.

Will it cost you anything for your child to be in this study?

There will be no costs for being in the study.

What if you or your child (or the child under your care) has questions about this study?

You and your child (or the child under your care) have the right to ask, and have answered, any questions you may have about this research. If you have questions, or concerns, you should contact the researchers listed on the information sheet (*below*). Please note that the telephone and fax numbers for USA include (09), the international access number you must dial from South Africa and (1), the country code for the US. From South Africa, you can dial the numbers exactly as you see them.

Elizabeth Jackson, MHS
Visiting Doctoral Student
Reproductive Health and HIV Research Unit (RHRU)
3rd Floor Westridge Medical Centre
95 Jan Smuts Highway
Mayville, Durban 4091

Cell: (TO BE DETERMINED)

Tel: 031 261 8840

Fax: 031 261 8868

Dr. Catherine MacPhail
Director (Adolescent Health Research)
Reproductive Health and HIV Research Unit (RHRU)
10th Floor Nurses Home
C H Baragwanath Hospital
Soweto
Cell: 083 4415415
Tel: 011 989 9291
Fax: 011 933 1227

Dr. William C. Miller
Associate Professor
Department of Epidemiology
The University of North Carolina at Chapel Hill School of Public Health
CB# 7435
2105F McGavran-Greenberg
Chapel Hill, NC 27599 USA
Tel: (09) (1) 919 966 9407
Fax: (09) (1) 919 966 2089

After April 20, 2007, Elizabeth Jackson may be reached in the United States at:

Elizabeth Jackson
Doctoral Trainee
Carolina Population Center
University of North Carolina at Chapel Hill
CB# 8120, University Square
123 West Franklin Street
Chapel Hill, NC 27516-2524 USA
Tel: (09) (1) 919 932 3887

What if you or your child (or the child under your care) have questions about the child's rights as a research participant?

All research on human volunteers is reviewed by a committee that works to protect the rights and welfare of research subjects. If you or the child have questions or concerns about his or her rights as a research subject you may contact, anonymously if you wish, the Committee for the Protection of Human Subjects, University of the Witwatersrand through Professor Peter Cleaton-Jones, Chairperson for the Committee for Research on Human Subjects. Tel: 011 716 4163

Or, you may contact the Institutional Review Board at the University of North Carolina at Chapel Hill at (09) (1) 919 966 7016 or by email to IRB_Subjects@unc.edu.

Adult Verbal Consent Script:

Study Team Member: Do you have any questions?
Have you understood the information provided?
Have you asked all the questions you have at this time?

If you voluntarily give permission to allow your child (or the child in your care) to participate in this research study, please see (NAME) who will record your name and the name of your child (or the child in your care) to indicate that you have given consent.

Study team member assisting with consent will discuss process with each adult and go over what will be said on the digital recording, prior to recording.

Script for digital recording

Study Team Member: This is the recording of consent for participant code number XXX, (MINOR'S NAME). Do you feel that you have been provided with enough information to make a decision about the involvement of (MINOR'S NAME) in this focus group study and do you voluntarily give consent for his/her participation?

Consenting Adult: I, (ADULT NAME), give consent for (MINOR'S NAME) to be involved in this focus group study.

Study Team Member: I, (NAME), have received informed consent from (ADULT NAME), on (DATE), at (TIME), in (LOCATION).

The date, time, and location of consent will be noted on contact information sheet form.

Adult Verbal Consent Script for discussions to be recorded:

Study Team Member: The study team seeks your permission to record discussions that your child (or the child in your care) participates in. Recordings will be anonymous and no names will be used. Field assistants who work on translation or transcription will be trained in ethics to maintain confidentiality. Transcribed discussions will be stored on a computer with password protection and in a locked cabinet. Recordings will be kept in a locked cabinet and on a password protected computer and erased after manuscripts have been prepared.

Your child (or the child under your care) may refuse to have the discussions taped or may ask to have the tape recorder turned off at any time without any penalty.

Study Team Member: Do you give permission to record discussions with your child (or the child under your care)?

If yes, please see (NAME) who will record your name and the name of your child (or the child in your care) to indicate that you have given consent.

Script for digital recording (to recorded after consent for participation)

Consenting Adult: I, (ADULT NAME), give consent for discussions with (MINOR'S NAME) to be recorded.

The date, time, and location of consent will be noted on contact information sheet form.

APPENDIX V:

QUALITATIVE DATA COLLECTION INSTRUMENTS

FOCUS GROUP GUIDES

YOUNG GIRLS 14-16

First FGD: Situation Number 1: 15 year old girl and 18 year old boy

Lindiwe is a 15 year old girl in grade 8. She has a boyfriend named Thola. Thola is 18 years old and he is in grade 11. Lindiwe and Thola have been together for about a month. Thola knew Lindiwe because they attended the same primary school. He proposed love to her one afternoon when she was walking home from school. Thola is Lindiwe's first boyfriend.

Questions:

1. What do you think about this story about Thola and Lindiwe – do you think it could happen here in your community? What words would you use to describe their relationship?
2. Why do you think a girl like Lindiwe would like to have a boyfriend? What would cause her to accept his proposal of love?
3. Let's talk about relationships like that of Thola and Lindiwe. Where do you think couples like Thola and Lindiwe spend time together? (Probe: Do you think that their parents, caretakers, or families would know that they are boyfriend and girlfriend?)
4. In this community, what behavior would be expected of a girl like Lindiwe in this type of relationship?
5. In this community, what behavior would be expected of a guy like Thola in this type of relationship?
6. If a couple like Thola and Lindiwe have sex together for the first time, who do you think makes the decision? (Possibly probe to determine if Lindiwe/girls like her are likely to want to have sex.)

More story: In this story, Thola tells Lindiwe that he loves her and that he would like to have sex with her. Lindiwe loves Thola and also wants to have sex with him. Both of them have been told about the risks of having sex – they have heard that having sex can result in pregnancy or infection with diseases such as HIV. Lindiwe knows that Thola has had many sex partners, such as his old girlfriend Thabile. Though she is pretty sure that Thola and Thabile are no longer having sex, and that Thola does not currently have another partner, Lindiwe is afraid that Thola could have already gotten a sexually transmitted disease. So, while Lindiwe really would like to have sex with Thola, she is afraid of STDs and pregnancy and she would like for them to use condoms.

7. What do you think Lindiwe should do? (How should she behave to protect herself from HIV?)
8. If Lindiwe acts as you recommend, how do you think Thola will react?
9. Do you think that Lindiwe should talk to Thola about her fears of HIV? (Probe: How?)

Orphan Context: Now we would like to ask you about how the family situation of young people may affect their partnerships. We would like to better understand the situations faced by young people whose parents are not living. We would like to understand these situations better in order to develop HIV prevention programs that can help young people without parents avoid becoming infected with HIV.

Let's go back to the situation of Lindiwe and Thola. We haven't talked about whether Lindiwe's parents are living, and whether or not she is staying with them.

10. If Lindiwe's parents have passed away and she is living with her Grandmother, how could this affect her relationship with Thola? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Possible Probes Below:*
 - a. How would this situation affect her decision to take Thola as a boyfriend? (Why?)
 - b. How would this situation affect her feelings about having sex? (Why?)
 - c. How would this situation affect where and when Lindiwe spends time with Thola? (Why?)
 - d. How would this situation affect her ability to ask Thola to use condoms? (Why?)
 - e. Are there other ways in which this situation could affect their relationship? (Why?)
11. If Lindiwe's father has passed away and she is living with her Mother, how could this affect her relationship with Thola? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Use Possible Probes from Above, as Necessary.*
12. Would things be any different if Lindiwe's mother was no longer alive but her father was providing for her care? For example, if Lindiwe lived with her Grandmother but her father visited each month and provided money for her food, clothing, and school fees – how could this situation affect Lindiwe's relationship with Thola? *Use Possible Probes from Above, as Necessary.*

Second FGD: Situation Number 2: 15 year old girl and 21 year old boy:

Today we would like to talk to you about a different girl, also 15 years old, named Noma. Noma has seen some girls in her community spending time with their older boyfriends. One of the girls, named Thabile, has 2 older boyfriends. Thabile has received gifts from her older boyfriends. One of them gave Thabile a cell phone and the other has given gifts like clothing. Noma has heard rumors that the dresses Thabile wears are purchased for her by one of her older male friends and that Thabile got money from him to pay for her new hair braids.

One day Noma is sent on an errand to the taxi rank. At the taxi rank, Noma recognizes one of the drivers named Maxwell. Noma has heard that Maxwell is older, at least 21 years old. He works as a combi driver. Maxwell is very friendly to her. After her errand, Noma walks home, thinking about Maxwell.

1. What are some of the reasons why a girl like Noma might want to have an older boyfriend like Maxwell? Do you think this happens to girls in your community?
2. What are some of the reasons why a girl like Noma might not want to have an older boyfriend?

More story: Noma sees Maxwell around town more and more often and he is always very friendly. One day Maxwell asks Noma to meet him in the grocery store across from the taxi rank after school, and she accepts. There, Maxwell says that he would like for Noma to become his girlfriend, and she accepts.

3. What do you think about this story about Noma and Maxwell – do you think it could happen here in your community? What words would you use to describe their relationship?
4. Let's talk about relationships like that of Noma and Maxwell. Where do you think couples like Noma and Maxwell spend time together? (Probe: Do you think that the parents, caretakers, or families of two people such as Noma and Maxwell would know that they are together?)
5. In this community, what behavior would be expected of a girl like Noma in this type of relationship?
6. In this community, what behavior would be expected of a guy like Maxwell in this type of relationship?

7. If a couple like Noma and Maxwell have sex together for the first time, who do you think makes the decision? (Possibly probe to determine if Noma/girls in her situation are likely to want to have sex.)

More story: Noma knows that Maxwell has had sex before with many girls. She is not sure, but thinks that Maxwell probably has other girlfriends. Noma is afraid that Maxwell could be infected with HIV. Noma is afraid of HIV and pregnancy and she would like for them to use condoms.

8. What do you think Noma should do? (How should she behave in order to avoid becoming infected with HIV?)
9. If Noma acts as you recommend, how do you think Maxwell will react?
10. Do you think that Noma should talk to Maxwell about her fears of HIV? How should she do this?
11. How is a girl like Noma likely to feel about Maxwell having other girlfriends or sexual partners?

Orphan Context: Now we would like to ask you about how the family situation of young people may affect their partnerships. Let's go back to the situation of Noma and Maxwell. We haven't talked about whether Noma's parents are living, and whether or not she is staying with them.

12. If Noma's parents have passed away and she is living with her Grandmother, how could this affect her relationship with Maxwell? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face.

Possible Probes Below:

- a. How would this situation affect her decision to take Maxwell as a boyfriend? (Why?)
 - b. How would this situation affect her feelings about having sex? (Why?)
 - c. How would this situation affect where and when Noma spends time with Maxwell? (Why?)
 - d. How would this situation affect her ability to ask Maxwell to use condoms? (Why?)
 - e. Are there other ways in which this situation could affect their relationship? (Why?)
13. If Noma's father has passed away and she is living with her Mother, how could this affect her relationship with Maxwell? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Use Possible Probes from Above, as Necessary.*
 14. Would things be any different if Noma's mother was no longer alive but her father was providing for her care? For example, if Noma lived with her Grandmother but her father visited each month and provided money for her food, clothing, and school fees – how could this situation affect Noma's relationship with Maxwell? *Use Possible Probes from Above, as Necessary.*

Third FGD: Situation Number 3: 15 year old girl choosing between partners of different ages:

Nonhlanhla is a 15 year old girl in junior secondary school. She lives with her Mother, older sister, and Grandmother. Her father passed away 3 years ago after a long illness. Her mother has not been able to find a job and there is little money at her household to pay for things like food, clothing, and school fees. Nonhlanhla had to leave school for one year when her older sister became very sick, because there was no money left to pay for her school fees after her sister's hospital bills.

Two young men in Nonhlanhla's community have expressed an interest in her. One is a student at her school. He is 18 years old. The other is 21 years old. He is out of school and working. Nonhlanhla is trying to decide if she should become the girlfriend of either of these young men.

1. For a girl like Nonhlanhla, what are some of the things she would consider about being in a relationship with her school-mate? (Probe about reasons she would want to be with him.)
2. If she enters into a relationship with her school-mate, what will be expected of her in the relationship? What will be expected of him? Who will decide about when they should have sex? Who will decide about whether condoms are used?
3. What are some of the things that a girl in Nonhlanhla's situation would consider about being in a relationship with the older 21 year old? (Probe about reasons she would want to be with him.)
4. If she enters into a relationship with the older 21 year old, what will be expected of her in the relationship?
5. What will be expected of him?
6. Who will decide about when they should have sex?
7. Who will decide about whether condoms are used?
8. If Nonhlanhla and her family were not experiencing economic troubles, would this influence her decision about which, if any, of these young men she chooses to be with?
9. If Nonhlanhla was living with both of her parents, would this influence her decision about which, if any, of these young men she chooses to be with?
10. Would a girl in Nonhlanhla's situation be likely to choose to be with both boyfriends? If so, how would that work?

Peer Intervention

Now that you have experienced talking about boyfriends and girlfriends, sexual partnerships, and HIV risk in this group, we would like to ask you about this experience and how it has been for you.

1. How have these discussions been for you? (Probe: Tell me about things you have gained from taking part in these discussions. Tell me about problems with talking about these issues in a group.)
2. What are some things that could provide support to young people like you that could help you to make healthy choices that you want to make to protect yourself from infection with HIV?
3. Would you be interested in participating in a peer support group on these issues?
4. Would you be interested in continuing to meet in this same group on a regular basis to provide peer support around safe sexual behavior and other related issues?

Focus groups who are interested in continuing to meet:

Please elect a chairperson, a secretary, and a treasurer. Your group will be linked with an Ark volunteer or staff member in this community who will manage a 6 month budget providing you with funds for refreshments at meetings.

Specific intervention is under development; the ultimate goal is to develop interested groups into support group interventions. Initial groups will visit Arks in other communities to share their peer group experiences.

OLDER GIRLS 17-19

First FGD: Situation Number 1: 18 year old girl and 21 year old boy

Lindiwe is an 18 year old girl in grade 11. She has a boyfriend named Thola. Thola is 21 years old and he is in grade 12. Thola and Lindiwe attend the same senior secondary school. He proposed love to her one afternoon when she was walking home from school. Thola is the first boyfriend that Lindiwe has ever had. Lindiwe and Thola have been together for about a month.

Questions:

1. What do you think about this story about Thola and Lindiwe – do you think it could happen here in your community? What words would you use to describe their relationship?
2. Why do you think a girl like Lindiwe would like to have a boyfriend? What would cause her to accept his proposal of love?
3. Let's talk about relationships like that of Thola and Lindiwe. Where do you think couples like Thola and Lindiwe spend time together? (Probe: Do you think that their parents, caretakers, or families would know that they are boyfriend and girlfriend?)
4. In this community, what behavior would be expected of a girl like Lindiwe in this type of relationship?
5. In this community, what behavior would be expected of a guy like Thola in this type of relationship?
6. If a couple like Thola and Lindiwe have sex together for the first time, who do you think makes the decision? (Possibly probe to determine if Lindiwe/girls like her are likely to want to have sex.)

More story: In this story, Thola tells Lindiwe that he loves her and that he would like to have sex with her. Lindiwe loves Thola and also wants to have sex with him. Both of them have been told about the risks of having sex – they have heard that having sex can result in pregnancy or infection with diseases such as HIV. Lindiwe knows that Thola has had many sex partners. Though she is pretty sure that Thola does not currently have another partner, Lindiwe is afraid that Thola could have already gotten a sexually transmitted disease. So, while Lindiwe really would like to have sex with Thola, she is afraid of STDs and pregnancy and she would like for them to use condoms.

7. What do you think Lindiwe should do? (How should she behave to protect herself from HIV?)
8. If Lindiwe acts as you recommend, how do you think Thola will react?
9. Do you think that Lindiwe should talk to Thola about her fears of HIV? (Probe: How?)

Orphan Context: Now we would like to ask you about how the family situation of young people may affect their partnerships. We would like to better understand the situations faced by young people whose parents are not living. We would like to understand these situations better in order to develop HIV prevention programs that can help young people without parents avoid becoming infected with HIV.

Let's go back to the situation of Lindiwe and Thola. We haven't talked about whether Lindiwe's parents are living, and whether or not she is staying with them.

10. If Lindiwe's parents have passed away and she is living with her Grandmother, how could this affect her relationship with Thola? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Possible Probes Below:*
 - f. How would this situation affect her decision to take Thola as a boyfriend? (Why?)
 - g. How would this situation affect her feelings about having sex? (Why?)
 - h. How would this situation affect where and when Lindiwe spends time with Thola? (Why?)
 - i. How would this situation affect her ability to ask Thola to use condoms? (Why?)
 - j. Are there other ways in which this situation could affect their relationship? (Why?)
11. If Lindiwe's father has passed away and she is living with her Mother, how could this affect her relationship with Thola? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Use Possible Probes from Above, as Necessary.*
12. Would things be any different if Lindiwe's mother was no longer alive but her father was providing for her care? For example, if Lindiwe lived with her Grandmother but her father visited each month and provided money for her food, clothing, and school fees – how could

this situation affect Lindiwe's relationship with Thola? *Use Possible Probes from Above, as Necessary.*

Second FGD: Situation Number 2: 18 year old girl and 26 year old boy:

Today we would like to talk to you about a different girl, also 18 years old, named Noma. Noma has seen some girls in her community spending time with their older boyfriends. One of the girls, named Thabile, has 2 older boyfriends. Thabile has received gifts from her older boyfriends. One of them gave Thabile a cell phone and the other has given gifts like clothing. Noma has heard rumors that the dresses Thabile wears are purchased for her by one of her older male friends and that Thabile got money from him to pay for her new hair braids.

One day Noma is sent on an errand to the taxi rank. At the taxi rank, Noma recognizes an older guy that she knows. His name is Maxwell and he is older, at least 26 years old. He has a job in town and appears to make a lot of money. Maxwell is very friendly to her. After her errand, Noma walks home, thinking about Maxwell.

1. What are some of the reasons why a girl like Noma might want to have an older boyfriend like Maxwell? Do you think this happens to girls in your community?
2. What are some of the reasons why a girl like Noma might not want to have an older boyfriend?

More story: Noma sees Maxwell around town more and more often and is always very friendly. One day Maxwell drives by Noma on her way home from school and asks her if she would like a ride. She accepts. In the car, Maxwell says that he would like for Noma to become his girlfriend, and she accepts.

3. What do you think about this story about Noma and Maxwell – do you think it could happen here in your community? What words would you use to describe their relationship?
4. Let's talk about relationships like that of Noma and Maxwell. Where do you think couples like Noma and Maxwell spend time together? (Probe: Do you think that the parents, caretakers, or families of two people such as Noma and Maxwell would know that they are together?)
5. In this community, what behavior would be expected of a girl like Noma in this type of relationship?
6. In this community, what behavior would be expected of a guy like Maxwell in this type of relationship?
7. If a couple like Noma and Maxwell have sex together for the first time, who do you think makes the decision? (Possibly probe to determine if Noma/girls in her situation are likely to want to have sex.)

More story: Noma knows that Maxwell has had sex before with many girls. She is not sure, but thinks that Maxwell probably has other girlfriends. Noma is afraid that Maxwell could be infected with HIV. Noma is afraid of HIV and pregnancy and she would like for them to use condoms.

8. What do you think Noma should do? (How should she behave in order to avoid becoming infected with HIV?)
9. If Noma acts as you recommend, how do you think Maxwell will react?
10. Do you think that Noma should talk to Maxwell about her fears of HIV? How should she do this?
11. How is a girl like Noma likely to feel about Maxwell having other girlfriends or sexual partners?

Orphan Context: Now we would like to ask you about how the family situation of young people may affect their partnerships. Let's go back to the situation of Noma and Maxwell. We haven't talked about whether Noma's parents are living, and whether or not she is staying with them.

12. If Noma's parents have passed away and she is living with her Grandmother, how could this affect her relationship with Maxwell? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face.

Possible Probes Below:

- a. How would this situation affect her decision to take Maxwell as a boyfriend? (Why?)
 - b. How would this situation affect her feelings about having sex? (Why?)
 - c. How would this situation affect where and when Noma spends time with Maxwell? (Why?)
 - d. How would this situation affect her ability to ask Maxwell to use condoms? (Why?)
 - e. Are there other ways in which this situation could affect their relationship? (Why?)
13. If Noma's father has passed away and she is living with her Mother, how could this affect her relationship with Maxwell? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Use Possible Probes from Above, as Necessary.*
14. Would things be any different if Noma's mother was no longer alive but her father was providing for her care? For example, if Noma lived with her Grandmother but her father visited each month and provided money for her food, clothing, and school fees – how could this situation affect Noma's relationship with Maxwell? *Use Possible Probes from Above, as Necessary.*

Third FGD: Situation Number 3: 18 year old girl choosing between partners of different ages:

Nonhlanhla is an 18 year old girl in senior secondary school. She lives with her Mother, older sister, and Grandmother. Her father passed away 3 years ago after a long illness. Her mother has not been able to find a job and there is little money at her household to pay for things like food, clothing, and school fees. Nonhlanhla had to leave school for one year when her older sister became very sick, because there was no money left to pay for her school fees after her sister's hospital bills.

Two young men in Nonhlanhla's community have expressed an interest in her. One is a student at her school. He is 21 years old. The other is 26 years old and has a good job. Nonhlanhla is trying to decide if she should become the girlfriend of either of these young men.

1. For a girl like Nonhlanhla, what are some of the things she would consider about being in a relationship with her school-mate? (Probe about reasons she would want to be with him.)
2. If she enters into a relationship with her school-mate, what will be expected of her in the relationship? What will be expected of him? Who will decide about when they should have sex? Who will decide about whether condoms are used?
3. What are some of the things that a girl in Nonhlanhla's situation would consider about being in a relationship with the older 26 year old? (Probe about reasons she would want to be with him.)
4. If she enters into a relationship with the older 26 year old, what will be expected of her in the relationship?
5. What will be expected of him?
6. Who will decide about when they should have sex?
7. Who will decide about whether condoms are used?
8. If Nonhlanhla and her family were not experiencing economic troubles, would this influence her decision about which, if any, of these young men she chooses to be with?
9. If Nonhlanhla was living with both of her parents, would this influence her decision about which, if any, of these young men she chooses to be with?
10. Would a girl in Nonhlanhla's situation be likely to choose to be with both boyfriends? If so, how would that work?

Peer Intervention

Now that you have experienced talking about boyfriends and girlfriends, sexual partnerships, and HIV risk in this group, we would like to ask you about this experience and how it has been for you.

1. How have these discussions been for you? (Probe: Tell me about things you have gained from taking part in these discussions. Tell me about problems with talking about these issues in a group.)
2. What are some things that could provide support to young people like you that could help you to make healthy choices that you want to make to protect yourself from infection with HIV?
3. Would you be interested in participating in a peer support group on these issues?
4. Would you be interested in continuing to meet in this same group on a regular basis to provide peer support around safe sexual behavior and other related issues?

Focus groups who are interested in continuing to meet:

Please elect a chairperson, a secretary, and a treasurer. Your group will be linked with an Ark volunteer or staff member in this community who will manage a 6 month budget providing you with funds for refreshments at meetings.

Specific intervention is under development; the ultimate goal is to develop interested groups into support group interventions. Initial groups will visit Arks in other communities to share their peer group experiences.

YOUNG MALES 14-16

First FGD: Situation Number 1: 15 year old boy and 14 year old girl

Thola is a 15 year old boy in grade 8. He has a girlfriend named Lindiwe. Lindiwe is 14 years old and in grade 7. Lindiwe and Thola have been together for about a month. Thola knew Lindiwe because they attended the same primary school. He proposed love to her one afternoon when she was walking home from school.

Questions:

1. What do you think about this story about Thola and Lindiwe – do you think it could happen here in your community? What words would you use to describe their relationship?
2. Why do you think a boy like Thola would like to have a girlfriend? What would cause him to propose love to a girl?
3. Let's talk about relationships like that of Thola and Lindiwe. Where do you think couples like Thola and Lindiwe spend time together? (Probe: Do you think that their parents, caretakers, or families would know that they are boyfriend and girlfriend?)
4. Let's talk about relationships like that of Thola and Lindiwe. In this community, what behavior would be expected of a guy like Thola in this type of relationship?
5. In this community, what behavior would be expected of a girl like Lindiwe in this type of relationship?
6. If a couple like Thola and Lindiwe have sex together for the first time, who do you think makes the decision? (Possibly probe to determine if Thola/boys like him are likely to want to have sex.)

More story: In this story, Thola tells Lindiwe that he loves her and that he would like to have sex with her. Lindiwe loves Thola and also wants to have sex with him. Both of them have been told about the risks of having sex – they have heard that having sex can result in pregnancy or infection with diseases such as HIV. Thola knows that Lindiwe has not had other sex partners, though he has had other partners. Earlier this year, Thola developed a genital discharge which has now gone away.

Thola would like for them to use condoms in order to avoid pregnancy and ensure that neither will transmit any diseases such as HIV to the other.

7. What do you think Thola should do?
8. If Thola acts as you recommend, how do you think Lindiwe will react?
9. Do you think that Thola should talk to Lindiwe about his fears of HIV? How should he do this?
10. What if Lindiwe tells Thola that she would like them to use condoms. How would a guy like Thola react?

Orphan Context: Now we would like to ask you about how the family situation of young people may affect their partnerships. We would like to better understand the situations faced by young people whose parents are not living. We would like to understand these situations better in order to develop HIV prevention programs that can help young people without parents avoid becoming infected with HIV.

Let's go back to the situation of Lindiwe and Thola. We haven't talked about whether Thola's parents are living, and whether or not he is staying with them.

11. If Thola's parents have passed away and he is living with his Grandmother, how could this affect his relationship with Lindiwe? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Possible Probes Below:*
 - a. How would this situation affect his decision to ask Lindiwe to be his girlfriend? (Why?)
 - b. How would this situation affect his feelings about having sex? (Why?)
 - c. Would Thola not having parents who are alive affect where and when he spends time with Lindiwe? (How and why?)
 - d. Would this situation affect his feelings about condom use, or his ability to talk to Lindiwe about condom use? (How and why?)
 - e. Are there other ways in which Thola not having living parents could affect their relationship? (Why?)
12. If Thola's father has passed away and he is living with his Mother, how could this affect his relationship with Lindiwe? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Use Possible Probes from Above, as Necessary.*
13. Would things be any different if Thola's mother was no longer alive but his father was providing for his care? For example, if Thola lived with his Grandmother but his father visited each month and provided money for his food, clothing, and school fees – how could this situation affect Thola's relationship with Lindiwe? *Use Possible Probes from Above, as Necessary.*

Second FGD: Situation Number 2: 15 year old boy choosing between partners of different ages

Jabulani is a 15 year old boy in junior secondary school. He lives with his Mother, older sister, and Grandmother. His father passed away 3 years ago after a long illness. His mother has not been able to find a job and there is little money at their household to pay for things like food, clothing, and school fees. Jabulani had to leave school for one year when his older sister became very sick, because there was no money left to pay for his school fees after his sister's hospital bills.

Jabulani is interested in two young girls in his community. One is a student in his class at school. She is 15 years old. The other is a 13 year old girl who he knows from primary school. Jabulani is trying to decide which of these two young girls he should propose love to.

1. What are some of the things a boy like Jabulani would consider about being in a relationship with his 15 year old school-mate? (Probe about reasons he would want to be with her.)
2. If he enters into a relationship with his 15 year old school-mate, what will be expected of him in the relationship?
3. What will be expected of her?
4. Who will decide about when they should have sex?
5. Who will decide about whether condoms are used?
6. What are some of the things that a boy in Jabulani's situation would consider about being in a relationship with the younger 13 year old girl? (Probe about reasons he would want to be with her.)
7. If he enters into a relationship with the younger 13 year old girl, what will be expected of him in the relationship? What will be expected of her? Who will decide about when they should have sex? Who will decide about whether condoms are used?
8. If Jabulani and his family were not experiencing economic troubles, would this influence his decision about which, if any, of these young girls he chooses to be with?
9. If Jabulani was living with both of his parents, would this influence his decision about which, if any, of these young girls he chooses to be with?
10. Would a boy in Jabulani's situation be likely to choose to try to be with both girlfriends? If so, how would that work?

Peer Intervention

Now that you have experienced talking about boyfriends and girlfriends, sexual partnerships, and HIV risk in this group, we would like to ask you about this experience and how it has been for you.

1. How have these discussions been for you? (Probe: Tell me about things you have gained from taking part in these discussions. Tell me about problems with talking about these issues in a group.)
2. What are some things that could provide support to young people like you that could help you to make healthy choices that you want to make to protect yourself from infection with HIV?
3. Would you be interested in participating in a peer support group on these issues?
4. Would you be interested in continuing to meet in this same group on a regular basis to provide peer support around safe sexual behavior and other related issues?

Focus groups who are interested in continuing to meet:

Please elect a chairperson, a secretary, and a treasurer. Your group will be linked with an Ark volunteer or staff member in this community who will manage a 6 month budget providing you with funds for refreshments at meetings.

Specific intervention is under development; the ultimate goal is to develop interested groups into support group interventions. Initial groups will visit Arks in other communities to share their peer group experiences.

OLDER MALES 17-19

First FGD: Situation Number 1: 18 year old boy and 17 year old girl

Thola is an 18 year old boy in grade 11. He has a girlfriend named Lindiwe. Lindiwe is 17 years old and in grade 10. Lindiwe and Thola have been together for about a month. Thola knew Lindiwe because they attended the same primary school, long ago. He proposed love to her one afternoon when she was walking home from school.

Questions:

1. What do you think about this story about Thola and Lindiwe – do you think it could happen here in your community? What words would you use to describe their relationship?
2. Why do you think a boy like Thola would like to have a girlfriend? What would cause him to propose love to a girl?
3. Let's talk about relationships like that of Thola and Lindiwe. Where do you think couples like Thola and Lindiwe spend time together? (Probe: Do you think that their parents, caretakers, or families would know that they are boyfriend and girlfriend?)
4. Let's talk about relationships like that of Thola and Lindiwe. In this community, what behavior would be expected of a guy like Thola in this type of relationship?
5. In this community, what behavior would be expected of a girl like Lindiwe in this type of relationship?
6. If a couple like Thola and Lindiwe have sex together for the first time, who do you think makes the decision? (Possibly probe to determine if Thola/boys like him are likely to want to have sex.)

More story: In this story, Thola tells Lindiwe that he loves her and that he would like to have sex with her. Lindiwe loves Thola and also wants to have sex with him. Both of them have been told about the risks of having sex – they have heard that having sex can result in pregnancy or infection with diseases such as HIV. Thola knows that Lindiwe has had other sex partners, and he has had a girlfriend before Lindiwe. After having sex with this girlfriend, Thola developed a genital discharge which has now gone away. Thola feels that in order avoid pregnancy and ensure that neither will transmit any diseases such as HIV to the other, he would like for them to use condoms.

7. What do you think Thola should do?
8. If Thola acts as you recommend, how do you think Lindiwe will react?
9. Do you think that Thola should talk to Lindiwe about his fears of HIV? How should he do this?
10. What if Lindiwe tells Thola that she would like them to use condoms. How would a guy like Thola react?

Orphan Context: Now we would like to ask you about how the family situation of young people may affect their partnerships. We would like to better understand the situations faced by young people whose parents are not living. We would like to understand these situations better in order to develop HIV prevention programs that can help young people without parents avoid becoming infected with HIV.

Let's go back to the situation of Lindiwe and Thola. We haven't talked about whether Thola's parents are living, and whether or not he is staying with them.

11. If Thola's parents have passed away and he is living with his Grandmother, how could this affect his relationship with Lindiwe? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Possible Probes Below:*
 - a. How would this situation affect his decision to ask Lindiwe to be his girlfriend? (Why?)
 - b. How would this situation affect his feelings about having sex? (Why?)
 - c. Would Thola not having parents who are alive affect where and when he spends time with Lindiwe? (How and why?)
 - d. Would this situation affect his feelings about condom use, or his ability to talk to Lindiwe about condom use? (How and why?)
 - e. Are there other ways in which Thola not having living parents could affect their relationship? (Why?)
12. If Thola's father has passed away and he is living with his Mother, how could this affect his relationship with Lindiwe? (There could be no effect; we just want to discuss with you what the effect could be, if any.) Base your answers on situations that young people in this community could face. *Use Possible Probes from Above, as Necessary.*

13. Would things be any different if Thola's mother was no longer alive but his father was providing for his care? For example, if Thola lived with his Grandmother but his father visited each month and provided money for his food, clothing, and school fees – how could this situation affect Thola's relationship with Lindiwe? *Use Possible Probes from Above, as Necessary.*

Second FGD: Situation Number 2: 18 year old boy choosing between partners of different ages

Jabulani is an 18 year old boy in senior secondary school. He lives with his Mother, older sister, and Grandmother. His father passed away 3 years ago after a long illness. His mother has not been able to find a job and there is little money at their household to pay for things like food, clothing, and school fees. Jabulani had to leave school for one year when his older sister became very sick, because there was no money left to pay for his school fees after his sister's hospital bills.

Jabulani is interested in two young girls in his community. One is a student in his class at school. She is 18 years old. The other is a 16 year old girl who he knows from primary school. Jabulani is trying to decide which of these two young girls he should propose love to.

1. What are some of the things a boy like Jabulani would consider about being in a relationship with his 18 year old school-mate? (Probe about reasons he would want to be with her.)
2. If he enters into a relationship with his 18 year old school-mate, what will be expected of him in the relationship?
3. What will be expected of her?
4. Who will decide about when they should have sex?
5. Who will decide about whether condoms are used?
6. What are some of the things that a boy in Jabulani's situation would consider about being in a relationship with the younger 16 year old girl? (Probe about reasons he would want to be with her.)
7. If he enters into a relationship with the younger 16 year old girl, what will be expected of him in the relationship? What will be expected of her? Who will decide about when they should have sex? Who will decide about whether condoms are used?
8. If Jabulani and his family were not experiencing economic troubles, would this influence his decision about which, if any, of these young girls he chooses to be with?
9. If Jabulani was living with both of his parents, would this influence his decision about which, if any, of these young girls he chooses to be with?
10. Would a boy in Jabulani's situation be likely to choose to try to be with both girlfriends? If so, how would that work?

Peer Intervention

Now that you have experienced talking about boyfriends and girlfriends, sexual partnerships, and HIV risk in this group, we would like to ask you about this experience and how it has been for you.

1. How have these discussions been for you? (Probe: Tell me about things you have gained from taking part in these discussions. Tell me about problems with talking about these issues in a group.)
2. What are some things that could provide support to young people like you that could help you to make healthy choices that you want to make to protect yourself from infection with HIV?
3. Would you be interested in participating in a peer support group on these issues?
4. Would you be interested in continuing to meet in this same group on a regular basis to provide peer support around safe sexual behavior and other related issues?

Focus groups who are interested in continuing to meet:

Please elect a chairperson, a secretary, and a treasurer. Your group will be linked with an Ark volunteer or staff member in this community who will manage a 6 month budget providing you with funds for refreshments at meetings.

Specific intervention is under development; the ultimate goal is to develop interested groups into support group interventions. Initial groups will visit Arks in other communities to share their peer group experiences.

INTERVIEW GUIDE

Two unstructured interviews are planned per respondent; for those respondents who would like to meet again, a third interview session will take place. In this third session, topics listed in the guide for sessions one and two which were not sufficiently covered will be revisited in greater depth.

Many more questions are included in this guide than there will be time for in any one interview. Because of the open-ended nature of interviews, I have attempted to cover all possible follow-up questions that could conceivably be asked in an interview. Note that not all of the probes that are listed will be used; they are listed in order to give the ethics review committee a comprehensive overview of all the kinds of information that could be covered in the interviews.

First interview session: an open-ended interview which will cover community and household environments, parents, friends, types of sexual relationships and multiple partnerships

Community environment and structure of daily life:

1) Tell me about what it is like to be a teenager in this community.

Possible probes:

- What kinds of things do you do in a typical day?
- Who do you spend time with?
- Tell me about the significant people in your life.
- How close do you feel to other people in this community?
- What organizations are you involved with in your community?
- Are you a member of any clubs?
- Do you attend any meetings?
- Are you involved in any religious organizations?
- How important is your religion to you in your every day life?
- How often to you go to religious meetings?
- Do you have a job? Tell me about that.

2) Tell me about school.

Possible probes:

- Do you go to school?
- Tell me how you feel when you go to school. Do you enjoy it?
- What do you study?
- Where is your school?
- How do you get there?
- What are your teachers like?

- What expenses are associated with going to school?
- Do you have enough money to attend school?
- Who pays school fees?
- How regularly do you go?
- Are you in and out because of lack of fees?

Household environment:

1) Tell me about your life at home.

Possible probes:

- Who lives in your compound/house/kraal?
- Tell me about the relationships you have with the people you live with.
- What language is spoken in your house? Are there more than one?
- Do you have your own room?
- Are there household members who are usually gone, (like a Dad or Uncle working in the mines)?
- What jobs do people who live in your household have?
- Tell me about any things that you are responsible for at home (things that you are supposed to do, like chores).
- Tell me about your house -- what materials is your house made from?
- Do you live in a house with electricity?
- Tell me about any household rules you are supposed to follow.
- Could you work outside your home if you wanted to?
- Do you work outside your home?
- Are you expected to go to school?
- Can you go out with friends any time that you want?
- Can you bring friends home?
- Can you go over to friends houses?
- Tell me about your household finances.
- Are people in your house worried about money? Tell me about that.

Parents and care-takers:

1) Tell me about your Dad.

Possible probes:

If deceased:	If still living:
• If he is deceased, tell me about when this happened.	• Tell me about your relationship with him.
• How old were you?	• Does he live with you?
• How old was your Dad?	• How often is he at home?
• What was his level of education/job?	• What is his level of education/job?
• Tell me about your relationship with him.	• Does he spend a lot of time away?
• Tell me about any significant memories you have about him.	• Tell me about any significant memories you have about him.
• Do you feel your life has changed	• How do you see his role in your

much since your Dad passed away?	household? What contribution does he make?
<ul style="list-style-type: none"> • Tell me about how your life is different. 	<ul style="list-style-type: none"> • Does he have authority over you and what you do? Tell me more about that.
<ul style="list-style-type: none"> • Tell me about how your life used to be. 	<ul style="list-style-type: none"> • Does he care if you go to school or not?
	<ul style="list-style-type: none"> • Tell me about his feelings about you.

2) Tell me about your Mom. Possible probes:

If deceased:	If still living:
<ul style="list-style-type: none"> • If she is deceased, tell me about when this happened. 	<ul style="list-style-type: none"> • Tell me about your relationship with her.
<ul style="list-style-type: none"> • How old were you? 	<ul style="list-style-type: none"> • Does she live with you?
<ul style="list-style-type: none"> • How old was your Mom? 	<ul style="list-style-type: none"> • How often is she at home?
<ul style="list-style-type: none"> • What was her level of education/job? 	<ul style="list-style-type: none"> • What is her level of education/job?
<ul style="list-style-type: none"> • Tell me about your relationship with her. 	<ul style="list-style-type: none"> • Does she spend a lot of time away?
<ul style="list-style-type: none"> • Tell me about any significant memories you have about her. 	<ul style="list-style-type: none"> • Tell me about any significant memories you have about her.
<ul style="list-style-type: none"> • Do you feel your life has changed much since your Mom passed away? 	<ul style="list-style-type: none"> • How do you see her role in your household? What contribution does she make?
<ul style="list-style-type: none"> • Tell me about how your life is different. 	<ul style="list-style-type: none"> • Does she have authority over you and what you do? Tell me more about that.
<ul style="list-style-type: none"> • Tell me about how your life used to be. 	<ul style="list-style-type: none"> • Does she care if you go to school or not?
	<ul style="list-style-type: none"> • Tell me about her feelings about you.

3) Tell me about people in your life who take care of you.

Possible probes for each person:

- Tell me about your relationship with (name of person).
- Does he/she live with you?
- How often is he/she at home?
- Does he/she spend a lot of time away?
- What is his/her level of education/job?
- Tell me about any significant memories you have about him/her.
- How do you see his/her role in your household? What contribution does he/she make?
- Does he/she have authority over you and what you do? Tell me more about that.
- Does he/she care if you go to school or not?
- How do you think he/she feels about you?

Friends:

1) Tell me about your friends.

Possible probes:

- Do you feel like you have a lot of friends?
- How would you describe your friends?
- Tell me about friends you have known for a long time.

- How do you meet people who become your friends?
- Tell me about newer friends you have made.
- Do you spend time with your friends alone or in groups?
- Do you have different groups of friends or are they more connected?
- Tell me about time that you spend with friends.
- How much time do you spend with your friends?
- How often do you see them?
- Where do you hang out with them?
- How many hang out at once?
- What kinds of things do you do with them?

Types of sexual relationships that peers engage in:

1) I would like to learn about the different types of relationships that young people in this community have with people of the opposite sex. I would also like to learn about sexual partnerships that young people in this community may have with people of the same gender. Tell me about the different kinds of partnerships that young people here have.

Possible probes:

- OK, so there are ____, ____, ____, and ____ types. Are there any others?
- Are there types that are different from boyfriend or girlfriend?
- Are there special terms for older partners?
- Are there special terms for younger partners?
- Does friendship make a difference in these categories?
- What does it mean to be in a sexual partnership?
- What kinds of sexual partnerships are there?
- When is a good time for boys to start having sex?
- When is a good time for girls to start having sex?

2) Tell me about _____ relationships.

For each type/category of relationship that a respondent describes, I will probe to understand its characteristics. If same sex relationships are mentioned, the gender references below will be changed appropriately.

Possible probes:

- Tell me about some of the things that make a relationship a _____ relationship instead of a friendship?
- How do people initiate the _____ type of relationship?
- How long are _____ relationships supposed to last?
- Where do partners spend time together?
- What are some of the things that they do when they are together?
- What are some of the things that boys in ____ relationship are supposed to do?
- Do all boys in ____ relationship act that way/do those things?
- What happens if they don't act that way/do those things?
- What are some of the things that girls in ____ relationship are supposed to do?
- Do all girls in ____ relationship act that way/do those things?
- What happens if they don't act that way/do those things?

- Under what circumstances would they start having sex?
- Tell me about who would decide about having sex.
- Tell me about how they decide about protection during sex.
- Tell me about where they might meet to have sex.
- How do they decide about where to meet?
- Why do you think boys and girls in ____ relationship stay in their relationship?
- What do girls gain, or what benefits do they receive from being in the relationship?
- What do boys gain, or what benefits do they receive?
- How do older people in the community feel about this type of relationship?
- How do teachers feel about this type of relationship among their students?
- Do young people have this type of relationship openly?
- Tell me about how the _____ type of relationships end?

Multiple partnerships:

1) Sometimes people can have more than one partner at a time. Tell me about how that works here among young people in this community.

Possible probes:

- Are there particular types of relationships that boys will have more than one of at the same time?
- Are there particular types of relationships that girls will have more than one of at the same time?
- Are there types of relationships where you aren't supposed to have more than one at once?
- Do a person's different partners know about each other?
- Do they know each other?
- If a person doesn't want his or her partner to know about other partners, how can that person keep the partnerships secret?
- If a person has more than one partner, and he or she is having sex with those partners, how often will he or she see each partner?
- How will a girl's friends feel about her if she has more than one partner at the same time?
- How will a boy's friends feel about him if he has more than one partner at the same time?

HIV risk:

1) Tell me about your feelings about HIV.

Possible probes:

- Do many people in this community have HIV?
- Do many people have AIDS?
- How can you tell if a person is infected?
- Do you know anyone who is infected? (Not asking for a name, just want to know if they know any body.)
- Tell me about this person – is he or she a peer, or older or younger? Is he or she a friend/family member/acquaintance/ friend of a friend?
- Do you know how that person became infected?
- Are you worried about becoming infected? Tell me about reasons why you are worried.
- Do you feel that there are things you can do/steps you can take to avoid getting HIV? Tell me about that. What kinds of things do you think you can do.

End of Interview:

- 1) I have asked you so many questions – are there any questions you would like to ask me?
- 2) Is there any thing else you would like to tell me about or that you think I should ask you or other young people about?

Second interview session: personal experience with different types of sexual partnerships

Number of partnerships:

In the last interview, you told me about ____ different types of partnerships. You mentioned (list) _____, _____, _____, etc. I'd like to ask you about your personal experience with each type of partnership, if you have had one. First of all, about how many different partnerships have you had?

Below, there are separate questions for persons who have not had sexual partners, persons who have had more than 6 partnerships, and persons who have had 6 or fewer partnerships:

If a respondent has not had any sexual partnerships:

Considering having sex:

- 1) I would like to ask you about your experiences with members of the opposite sex. Are there any times that you have thought about, or come close to having sex with anyone? Could you tell me about that?

Possible probes:

- Was there a particular time when you came close to having sex? Tell me about that.
- Whose idea was it to have sex? Did one person want to have sex more than the other person?
- Can you tell me about how you met this person?
- Tell me about your relationship.
- Is the relationship still going on?
- Tell me about some of the reasons you think the relationship ended.
- How often do you or did you see this person?
- How long did you know each other before one of you thought about having sex?
- When you didn't have sex, did it change the relationship?
- Do your parents know about this person? Tell me about how they feel about your relationship.
- Do your friends know about this person? Tell me about how they feel about your relationship.
- Do you think you are likely to ever have sex with this person?
- What are some of the reasons why you do not plan to have sex with this person?
- What are some of the reasons why you want to have sex with this person?

End of Interview:

- 1) I have asked you so many questions – are there any questions you would like to ask me?
- 2) Is there any thing else you would like to tell me about or that you think I should ask you or other young people about?

If a respondent has had more than 6 different partnerships: I would like to ask you about each different partnership, but we may not have time to talk about every partner today, so I would like to

start by asking you in detail about your first partnership. Then, I'd like to ask you briefly about the sequence and timing of each partnership that you had after that one, up until the present. After that, I would like to ask you about your most recent experience with each of the different types of partnerships we discussed (list again.....).

First partnership:

1) Tell me about your relationship with the first person you had sex with.

Possible probes:

- Can you tell me about how you met this person?
- Where and how did you meet?
- Tell me about which type of partnership it was most like based on the list we discussed: (list).
- What made it this type of partnership?
- How old were you?
- Tell me about your partner.
- How old was your partner? What did he or she do?
- Did you meet near or far from where you live? Was it at school, a party, a bar, a public place – or through friends?
- Tell me about what happened the first time you met.
- Tell me about the next time you saw this person.
- Where did you usually meet this person to spend time together?
- How long did you know each other before one of you thought about having sex?
- Tell me about the first time you had sex with this partner.
- Whose idea was it to have sex? Did one person want to have sex more than the other person?
- How often did you have sex?
- Did you have sex every time that you were together?
- Where did you have sex?
- Has your relationship changed over time?
- Did things change after you had sex?
- What happens if you don't feel like having sex?
- Tell me about how you feel about having sex with this person.
- Do you enjoy it?
- What are some of the things you like about having sex with this person?
- What are some of the thing you don't like about having sex with this person?
- Do you use protection when you have sex? Tell me about that... why or why not?
- If you want to use condoms, how does your partner feel?
- If your partner wanted to use condoms, how would you feel?
- Is the relationship still going on?
- Tell me about some of the reasons you think the relationship ended.
- How long do you think the relationship will last?
- Do your parents know about this person? Tell me about how they feel about your relationship.
- Do your friends know about this person? Tell me about how they feel about your relationship.
- What were some of the things you feel that you gained from this relationship?

- What were some of the things you felt you lost from this relationship?
- What about your partner – what do you think were some of the things that he or she gained from the relationship?
- Do you think he or she was happy in the relationship?
- How much control would you say you had in your relationship?

Partnership History:

OK, now I would like to ask you about the other people you have had sex with:

- 1) Who was after (previous partner)?
- 2) What type of relationship would you say it was?
- 3) How old were you at the time and how old was the other person?
- 4) How long did the relationship last?

Repeat 1-4 until reach most recent partnership.

Other Partnerships:

For each type of partnership mentioned in partnership history, discuss the most recent partnership. Then, discuss other partnerships as time permits.

- 1) Tell me about your partnership with _____.

Possible probes: *from probes listed under First Partnership above.*

Multiple Partnerships:

- 1) Have you ever been in more than one relationship at once? Tell me about how it is to have more than one partner at the same time.

Possible probes:

- Why did you have more than one partner at the same time?
- Did your partners know about each other?
- When they found out about each other, what happened?
- How did it make you feel?
- Do you think that any of your partners have had other partners at the same time that they were with you?
- How did you feel about this?
- Did it worry you?
- Did your partner know that you knew?
- Did your partner's other partner know about you?
- How did that make you feel?

End of Interview:

- 1) I have asked you so many questions – are there any questions you would like to ask me?
- 2) Is there anything else you would like to tell me about or that you think I should ask you or other young people about?

If a respondent has had 6 or fewer different partnerships: I would like to ask you about each of your different partnerships, starting with your first partnership. Then, I'd like to ask you about each partnership that you had after that one, up until the present.

First partnership:

- 1) Tell me about your relationship with the first person you had sex with.

Possible probes: *from probes listed under First Partnership above.*

Subsequent Partnerships:

- 1) OK, tell me about the next partnership that you had.

Possible probes: *from probes listed under First Partnership above.*

Multiple Partnerships:

- 1) Have you ever been in more than one relationship at once? Tell me about how it is to have more than one partner at the same time.

Possible probes: *from probes listed under Multiple Partnership above.*

End of Interview:

- 1) I have asked you so many questions – are there any questions you would like to ask me?
- 2) Is there any thing else you would like to tell me about or that you think I should ask you or other young people about?

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